

ALPINE SUSPENSION LINE PROGRESS

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"THE TIMES" OF THE TRANSPORT WORLD

ELECTRONIC COMPUTATION OF RAIL TIMETABLES

See Page 11

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LONDON, AUGUST 30, 1958

PRICE NINEPENCE

By Pullman from Sheffield

MOST striking of the winter train service alterations is the transfer of the allegiance of *The Master Cutler* from Marylebone to Kings Cross. In its new form it is a diesel-hauled all-Pullman train, running non-stop over the 161 miles via Retford in 165 minutes, despite the heavy restrictions over portions of the route. It will leave Sheffield Victoria at 7.20 a.m. from September 15 and return from London Kings Cross at 7.20 p.m. In the meantime the 2,000-h.p. diesel locomotive and the six Pullmans will run from London to Sheffield at 11.20 a.m. in 2 hr. 55 min. with calls at Peterborough, Grantham and Retford, with a corresponding trip back at 3.20 p.m., thus getting in 3,220 miles for locomotive and coaches from Monday to Friday. It would be rather nice if the Eastern Region's diesel-hauled Pullman—first of its kind in this country—could be hauled by a locomotive in Pullman colours, but for good measure the motive unit will get in some night mileage on freight duties. The cars allocated to the train include first-class cars *Sappho*, *Plato* and *Rosamund*, which have been re-conditioned at Brighton for the purpose. The second-class cars include two former steel kitchen cars in which the kitchen portion has been stripped out to make a compartment for guard and luggage. Other Eastern Region developments include the adoption of 2-hr. London-Norwich schedules for six trains, the result of diesel traction. There are cuts in Clacton running times with the transfer of Britannias to the expresses to and from London Liverpool Street. The service between Liverpool Street and Norwich via Cambridge is revised and most trains going to or from Kings Lynn and Hunstanton have an Ely-Norwich diesel connection in about the same overall time. Great Northern Line plans for suburban passengers at Kings Cross, with reconstruction of the layout, diesel haulage and eventually electrification, are set out in *The Shape of Things To Come* by Mr. G. F. Huskisson, traffic manager, Kings Cross.

Retrenchment in Highland Steamers

SOMETHING over a century ago the nine steamers on the West Highland service operated by the Burns family were handed to David and Alexander Hutcheson, departmental heads of the Burns line, who had as partner David MacBrayne, a nephew of the former owners. Some 28 years later, in 1879, the style of David MacBrayne, was adopted and has been retained for 79 years through development and recession, good times and bad, and the great change of three decades ago when the line was jointly acquired by Coast Lines and the London Midland and Scottish Railway. Serving the Highlands and Islands is a difficult trade, long deemed worthy of subsidy, but it is evident that a new crisis is upon it, brought about by the development of the private car, the motor coach, and the vehicle ferries, through which Skye is virtually no longer an island, but on a westward extension of the Scottish highway system. The 1957 total of cars, 46,000, may be compared with the 22,000 of 1956 over the Kyle-Kyleakin ferry. Fresh from studying dock labour problems, Lord Cameron, in his capacity as chairman of the Islands Advisory Panel, has been outlining to local authorities MacBrayne's plans for retrenchment. The chain of events begins with the *St. Columba*, built in 1912 and due to come off the Gourock-Tarbert-Ardri-shaig run at the end of the summer. The diesel-electric *Lochfyne* of 1931 will take up its run all the year round, being itself replaced on its summer tourist duties by *Lochearn*, now in reserve, with *King George V*, at present on Oban-Iona. The Oban-Tobermory service is at present provided by *Lochinvar*, dating from 1908 and due for scrapping. To cover *Lochinvar's* duties the *Lochnevis* is needed and would then come off the Mallaig-Kyle-Portree daily service. There is the rub, which is causing consternation to the burghers of Portree, who, despite the numbers of travellers on Skye by car and bus, see only disaster to their town's prosperity if the *Lochnevis* is replaced by MacBrayne buses.

CURRENT TOPICS

Replacing the M. and G.N.

PROPOSALS for closing the Midland and Great Northern section of the Eastern Region of British Railways have now been developed in greater detail and will be submitted to the Transport Users' Consultative Committees concerned on September 15. In particular, there have been full discussions about the provision of alternative services. The Eastern Area Board announces agreement with the Eastern Counties Omnibus Co., Limited, on this, subject to the approval of the traffic commissioners. Further bus services will operate between Peterborough, Wisbech, Kings Lynn, Melton Constable,

whilst still achieving equal or superior performance and complete interchangeability over the entire series. Considerable reduction in the stocking of part numbers can thus be effected. The design of the U.K.-AN range meets the requirements of Ministry of Supply Specification EL 1884 and Radio Component Specification 321 which are far more stringent than their American counterparts. Perfected after the successful conclusion of an intensive research programme at the Swindon-based electrical connector division of the Plessey Company, the introduction of the U.K.-AN range is an all-British achievement. We were much

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Yarmouth and Norwich, and these will provide over a half a million additional bus-miles a year, or more than 10,000 a week. In addition, the Lincolnshire Road Car Company has agreed to operate extra bus services between Spalding and Saxby. Public service will thus continue where the train services are being withdrawn. Freight requirements of the area have also been considered. In the first place, it is proposed that a number of spurs shall remain open for freight traffic, but with reduced status, and with the closing of certain intermediate stations. These are Spalding to Sutton Bridge; Peterborough to Wisbech North; Kings Lynn to South Lynn and South Lynn to Gayton Road; and Melton Constable to Norwich City. The future of the last-mentioned section will be kept under review until alternative plans for the handling of freight traffic elsewhere in Norwich are developed. In the second place, the traffic managers are negotiating with traders and offering them alternative methods of transport for their particular traffics. Special arrangements are also being made for conveying parcels traffic either by road or by rail. Opponents of the closure met at Spalding on August 25 to plan a concerted policy.

Dollar-Saving

RECENTLY introduced by the Plessey Co., Limited, is a new range of plugs and sockets, the U.K.-AN series, to meet changing and expanding design requirements. This range is fully interchangeable with American AN or MS series and incorporates the special features of the contemporary AN types in addition to several new features. The design also embodies the most desirable attributes of 30 American types in one connector. The development of this new range will mean a considerable saving in dollars by making available in the sterling area an important component which has formerly, in most instances, been imported from the United States. Additionally the new Plessey range reduces the number of separate items, many thousands in the American AN range, to under a thousand,

impressed on a recent visit to the works with the resistance to deterioration of the new plugs and sockets when tested under the salt water, humidity, flame and other severe conditions.

Sailing Through the Alps

THE traveller in the Alps becomes accustomed to using a variety of methods to reach the top of a mountain, or even to reach a high-level village or hotel. These range from the rack railway and the cable railway running on tracks (the *Standseilbahn* or *funiculaire*) to the skilift in which the passenger may be carried in a chair or merely pulled up the snowslope on his skis. In general, the higher one goes the less the carrying capacity of the carrying unit; the electric railway, even if it climbs steeply on a rack, usually has cars carrying 100 or more, with perhaps two cars to the train; the cable railway car, especially if its journey is short, may cater for as many but with *Sitzplatze* for only half the number. In the *Luftseilbahn* or *téléphérique*, which has no equivalent in Britain but is sometimes awkwardly called a cable airway or aerial cableway, to travel standing is normal; the car usually holds 30 to 60 but at most will have fixed or tip-up seats for about six and these are best avoided at busy times when the density of the standees resembles that in a London tube train. However, while the large car is general on *Luftseilbahnen* that are advertised for the benefit of the tourist, the wanderer among smaller villages may find a conveyance on exactly the same principle but on a smaller scale provided for the benefit of the local people, such as children from the upland farms who have to attend the village school. Each of the two cars is suspended from what appears to be a flimsy wire, and consists of no more than a tubular steel framework with two small wooden seats facing each other, removable wooden sides, and a tarpaulin cover which may keep out some of the worst of the weather. Control is from one end only, and the passenger from the other end follows a standard procedure (place goods in car, ring bell according to a prearranged code, or announce his presence on the tele-

phone, then climb into the car) which normally ensures that he is not airborne until he and his impedimenta are stowed inside.

Gondolas in the Air

AS the car is liable to be subject to wind pressure while suspended a thousand feet above terra firma (if the *Seilbahn* happens to cross a valley en route, despite the absence of hurricanes from Alpine valleys) such stowage is highly desirable. The local people are, presumably, all born with "a head for heights," and the stranger may take comfort from the fact that the seemingly frail equipment is subject to regular government inspection. A less exposed method of travel au pair is now available, however, in the form of the *Gondelbahn*, up which the passenger is conveyed in a brightly painted two-seater streamlined car with all-round windows providing protection and a good view. This is really a development of the chair-lift, since it uses an endless conveyor which continues in motion all the time it is open for traffic. It combines the on-demand operation of the chair-lift with a comfort greater than that normally enjoyed in a *Luftseilbahn*. A special article reviewing the recent rapid developments of cable transport in the Alps, which suggests that the possibilities in Great Britain deserve close investigation, appears on page 3 of this issue.

Road Progress Charted

MAJOR road schemes started in England and Wales in the first half of this year will cost over £35 million, almost double those of any similar period since the war. This is shown in *See How They Go*, No. 6, latest in a series of coloured charts issued by the British Road Federation; it records the estimated completion dates of all road and bridge projects costing over £100,000 started in the first six months of this year. Of the total, £27 million can be attributed to the big motorway projects, started in the spring. Three other schemes worth over £1 million are the Stretford-Eccles by-pass (part two) in Lancashire, the Catterick by-pass on the Great North Road in Yorkshire and the eastern section of the Maidstone by-pass in Kent. Prepared from recent announcements in the House of Commons by the Minister of Transport, the chart has been circulated among Members of Parliament, local authorities and students.

Polar and Lunar

THE vigorous research programme which has been pursued for more than a decade in the United States has recently had two particularly noteworthy culminations in the voyage of the atomic-powered submarine *Nautilus* under the ice of the North Pole and the first attempt, which unfortunately failed, to set a satellite in orbit round the moon. These events have created their due amount of public interest but this has been fanned into somewhat over-optimistic assumptions as to the imminence of significant results. The voyage of *Nautilus*, for example, has been hailed as heralding a new route for the movement of freight between the west coast of North America and European ports. This may prove possible in due course, but much work would need to be done on the production of suitable vessels at reasonable cost; a good deal has still to be discovered regarding the wide issues of safety of nuclear ships. The attempt to fire a satellite to the moon was based upon the sound idea of striving first, with the aid of a television camera installed in the satellite to discover what lies on that part of the moon invisible from the earth. The process may well be a long one and it may be recalled that it will be 75 years ago on January 5 that the first-night audience at the Savoy Theatre heard Prince Hilarion declare in *Princess Ida* that the girl graduates of Castle Adamant not only intended to send a wire to the moon but had also "a firmly rooted notion they can cross the Polar ocean." Gilbert as a prophet may yet prove as successful as Tennyson (whose *Princess* was the model for *Princess Ida*) who clearly foresaw aerial navigation in *Locksley Hall*.

ROAD TEST REPORT

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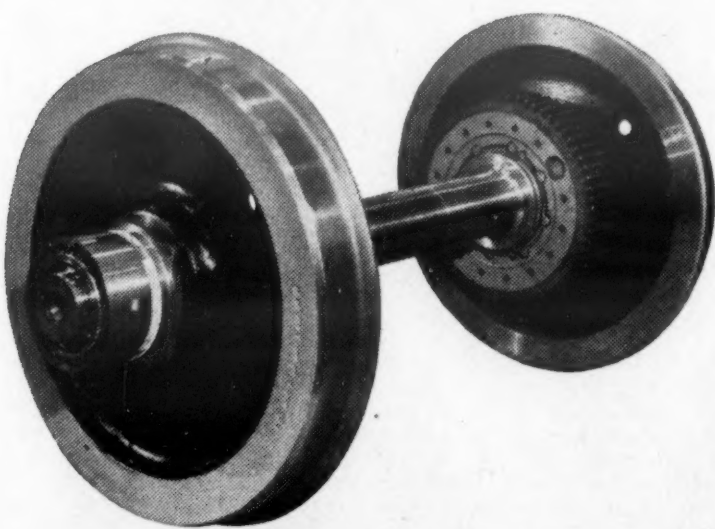
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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.

Towards Economic Stability

TO the trade unions the second report of the Cohen Council* will be no more palatable than the first which was published in February last, though the policies then advocated, which were in line with measures adopted by the Government in September, 1957, have undoubtedly proved effective. In its first report the Council, consisting of a judge, an accountant and an economist in the persons of Lord Cohen, Sir Harold Howitt and Sir Dennis Robertson, insisted that if inflation was to be halted the demand for goods must be damped down, implying a check on production and an increase in unemployment, while wage increases must be drastically reduced and made to conform with increased productivity. So unpopular were these proposals that the Trades Union Congress refused further to discuss its problems with the Council, though the latter has received full co-operation from trading and industrial organisations as well as from Government Departments. In fact, inflation has been halted, though confidence in the pound could easily be impaired again. There has been a sharp, and very necessary, improvement in the gold and dollar reserves and an improvement at home in the trend of prices; there are signs that incomes are rising more slowly; total national output has risen, but only a little, and industrial production has fallen slightly, and there has been a small rise in unemployment. In fine, "the dangers of inflation have only been scotched, not killed." There is no cause for complacency: "We must not suppose that we have solved the problem of getting the growth of incomes into line with that of productivity merely because in the year 1958 increases in income look like being distinctly lower than in previous years," states the report.

Wages—A Change for the Better

IN these circumstances the Council warns that a policy aiming at an expansion of demand should proceed gradually and with caution; levels of demand as high as the peak levels of the past must be avoided if inflation is to be prevented. To maintain high and stable employment while avoiding inflation, if it is possible at all, the report cryptically states, will certainly call for a rather delicate regulation of the general level of activity. It is far from certain that the present understanding of the working of economic forces is sufficient for the purpose. A speeding up of the preparation of economic information would be a real help. Wage and salary increases this year have averaged roughly 3½ per cent against 5 per cent in 1957 and 8 per cent in 1956. On this subject the report remarks that if the 3½ per cent figure is also the typical result of the negotiations which are still to come, the year as a whole will have been marked by a definite reduction in the scale of wage increases, and from the point of view of achieving price stability this must be regarded as distinctly a change for the better. But it would be very wrong to suppose that this was an exceptional year, after which we could cheerfully return to the happy days when annual wage increases typically ran at the rate of 5, 6 or 7 per cent. Indeed, the Council stresses that such wage increases as are granted next year should be lower than this year's on the surprising and debatable theory that not only is a 3½ per cent increase higher than the present rate of productivity increase but is

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"higher than any rate of productivity increase which can reasonably be forecast over any long period of future years." However, progress made in checking inflation will mean that "next year's medicine need not be so nasty as this year's," and in 12 months' time parties in wage talks will be looking back over a period of more stable prices with possibly a real advance in purchasing power.

Public Services and Wage Increases

OF interest to the transport industry is the Council's proviso to its insistence upon the importance of relating the growth of productivity in the rapidly progressing industries to that over the whole economy and thus covering those sectors in which the growth of productivity is less rapid than that of the economy as a whole. Thus the report states:

It must not be thought that this statement is refuted by recent cases in which the Government has successfully insisted that wage increases in certain public services should be met without a rise of prices. The alternative sources from which the increases will be made consist (in the Government's intention at least) of economies either by cutting out unnecessary use of labour, materials, etc., or by cutting out services which could not be made to pay. Economies of the former type may be unequivocally desirable, but are highly likely to be inextricable in scope. Economies of the second type may also be desirable up to a point, for there may be services which could not be made to pay at any level of prices. Beyond that point, however, they represent not a solution of the problem but an evasion of it.

There has been a tendency in recent discussions to lump together economies obtained by producing services more efficiently, and economies obtained by abolishing services, as though they were the same thing, on the grounds that they are both means of paying higher wages without calling for a subsidy. But from the point of view of the public they are *opposite* things. Abolishing a service has the same effect as raising its price to a prohibitive level, with the convenient difference that no index number of the cost of living can be affected. But it by no means follows that greater harm is not done to the public interest than by a rise in price. Indeed, there is a presumption that the community is better off for having available to it any service which can be made to cover its costs at *some* price which the public is willing to pay. A rigid rule against price increases, while it may have had the effect of exerting counter pressure against wage demands, could not be maintained indefinitely in a sector where productivity grows slowly without causing in the end a quite unjustifiable elimination of wanted services.

Overall price stability, therefore, requires that in sectors where productivity rises faster than the average rate the prices of products should be falling.

Productivity

MANY will regard this report as depressing and out of line with the prospects of expansion which have been mooted recently. But the Council is fulfilling its duty by reminding the nation of the hard economic facts underlying the present situation which, owing to Government measures, marks a considerable and speedy improvement over the last few months. The truth is not yet realised that higher production must precede higher wages; until that is fully understood inflation will remain in the offing, and another bout of inflation would mean mass unemployment. Mr. A. Birch, chairman of the T.U.C. Economic Committee, protests that the Council is obsessed with wages and gives insufficient attention to other factors such as the need to use to the full Britain's productive capacity. The report points out, however, that much plant and machinery no longer being used is obsolete. It is costly to run and could only be brought back into use again at the expense of rising costs and prices with renewed competition in the labour market and still more wages demands. Expansion is necessary but it must be gradual.

Forthcoming Events

- August 30-September 7.—Norbury Transport and Model Railway Club. Tour of Isle of Man, Blackpool, Belfast and Dublin.
- September 1-7.—Society of British Aircraft Constructors. Flying display and exhibition. At Farnborough. (Public days September 5, 6 and 7.)
- September 2.—Railway Correspondence and Travel Society (Sheffield). Paper by Mr. J. F. Clay, "Fifty Years of Midland Performance." At 44 Union Street, Sheffield. 7.30 p.m.
- September 2.—Permanent Way Institution (Leeds and Bradford). Paper by Mr. J. Nichols, "American Railroads." At B.R. Social and Recreational Club, Ellis Court, Leeds. 7 p.m.
- September 3.—Institute of Road Transport Engineers (Metropolitan). Visit to Vauxhall Motors, Limited, Luton.
- September 3.—Institute of Road Transport Engineers (East Midlands). Visit to Hepworth and Grimsby, Limited, Bradford.
- September 4.—Institute of Transport (Derby, Bucks and Oxon). Visit to London Airport. Meet 83 Lower Thorn Street, Reading. 2 p.m.
- September 5.—Railway Club. Re-enactment by Mr. K. G. Carr, "The Great Bristol Contest of 1835." At 320 High Holborn, W.C.1. 7 p.m.
- September 5-15.—Railway Correspondence and Travel Society. Tour of Austria.
- September 6.—Railway Correspondence and Travel Society. (South of England). Paper by Mr. A. P. Hancox, "The North London Railway." At M.F.D. Social Hall, Eastleigh. 6.30 p.m.
- September 8-12.—Municipal Passenger Transport Association. Annual conference. At Blackpool.
- September 8-13.—First International Congress of the Aeronautical Sciences. At Madrid.
- September 10.—Light Railway Transport League. "A Trio of Tramways: Maidstone, Northampton and Sunderland." At 153 Drummond Street, London, N.W.1. 3 p.m.
- September 11.—Railway Correspondence and Travel Society (Bristol). Paper by Mr. D. S. M. Barrie, "The Pre-Grouping Railways of South Wales." At Grosvenor Hotel, Bristol. 7.15 p.m.
- September 12.—Electric Railway Society (Birmingham). Paper by Mr. H. J. Prigmore, "Rapid Transit and Suburban Railways." At Exchange and Engineering Centre, Birmingham. 7 p.m.
- September 13-14.—Railway and Canal Historical Society. Visit to remains of Somerset Coal Canal and railways. Dorset and Somerset Canal, broad gauge G.W.R. architecture and Kennet and Avon Canal features. Based on Bradford-on-Avon.
- September 26-October 4.—Commercial Motor Transport Exhibition. At Earls Court.

MODERN TRANSPORT has an arrangement with Reuter's Trade Service whereby publication is made in this newspaper of all essential news from all parts of the world concerning traffic and transport by rail, road, sea and air and allied interests.

* Council on Prices, Productivity and Incomes: Second Report. H.M. Stationery Office. 2s. net.

MODERN DEVELOPMENTS IN AERIAL ALPINE TRANSPORT

Many New Suspension Lines

By CECIL J. ALLEN, M.Inst.T., A.I.Loco.E.

A TRANSPORT development of major importance in Alpine countries during the past quarter of a century has been the widespread building of suspension lines of various types. The principal purpose of most of these lines is to cater for winter sports enthusiasts, but they find considerable use in summer also by giving access to mountain summits that are fine viewpoints and also in facilitating walking on the high mountain paths. Many of the suspension lines also have been built by high-lying village communes, to which the cost of railway building would have been completely prohibitive, in order to provide direct communication between these villages and the railway lines in the valleys below.

As a measure of the extent of this type of construction, it may be mentioned that in Switzerland some fifty new suspension lines of different types have been brought into use during the past five years, bringing the total in public operation in that country alone up to 88, with numerous small semi-private lines also which carry passengers.

Advantages

The advantage of the suspension method is the relative cheapness of both construction and operation. As compared with a rack-and-pinion or a funicular railway, the suspension line

until they reach the end of the runway, where grips at the top of the arm engage the moving rope. On reaching the other terminal, the grips automatically disengage as the chairs reach the runway, so allowing the latter to come to rest.

Whereas a rope-worked funicular railway can be curved when necessary, as the closely spaced pulleys in the centre of the track can hold the moving rope to any desired curve, no curvature is possible when the suspension principle is in use. If, due to the configuration of the ground, a change of direction is necessary with a chair-lift, a second and independent ropeway becomes necessary; and this duplication is also desirable with any of the longer lines, in order to avoid the use of a moving rope more than about 6,000 yd. in length, which would be needed with a 3,000-yd. chair-lift.

Ingenious Junctions

A number of the lines with more than one independent section, however, are provided with ingenious junction stations which make it possible to pass chairs and their occupants through from one ropeway to the next. In Switzerland the most notable line of this type is that from Grindelwald up to First, which has four sections totalling in length 4,762 yd., with three intermediate junction stations; chairs running from end to end are lifted through a total difference in level of 3,625 ft. This particular line owns 220 pairs of chairs, which can be passed on to the ropeways at whatever frequency is necessary to cope with the traffic, provided that a distance of not less than 130 ft. is

which combines the principle of a chair-lift with that of *Luftseilbahn* or téléphérique, with its large completely enclosed cabins; a number of the latest lines to be opened are of the *Gondelbahn* type, and have a carrying capacity equal to that of the busiest chair-lifts, while at the same time offering passengers full protection from inclement weather.

With most of these lines the small cabins seat four passengers, in pairs facing one another, though in five of the most recent lines—the longest of which is the 5,580-yd. line from Zweisimmen in the Bernese Oberland to the summit of the Rinderberg—the tiny cabins, circular in form, seat two passengers only. In nearly all these lines the cabins come off the moving rope on to runways at the terminals, and so are entered while stationary. But an interesting variant is found at Saas-Fee in the Valais; on the 2,685-yd line to Spielboden on the Lange Fluh the four-seater cars are permanently attached in pairs to the moving rope, which automatically is retarded as each pair of cabins reaches the upper and lower stations. Passengers therefore enter and leave the



The recently opened Luftseilbahn from the summit of Pilatus in Fräkmüntegg, giving a direct route from the mountain to Lucerne

a line which carries a very heavy winter sports traffic. This has been built in three sections. The two lower sections, with a junction between them through which through chairs are passed, have supporting cables for the cabins which are independent of the haulage cable; the cabins are detached from

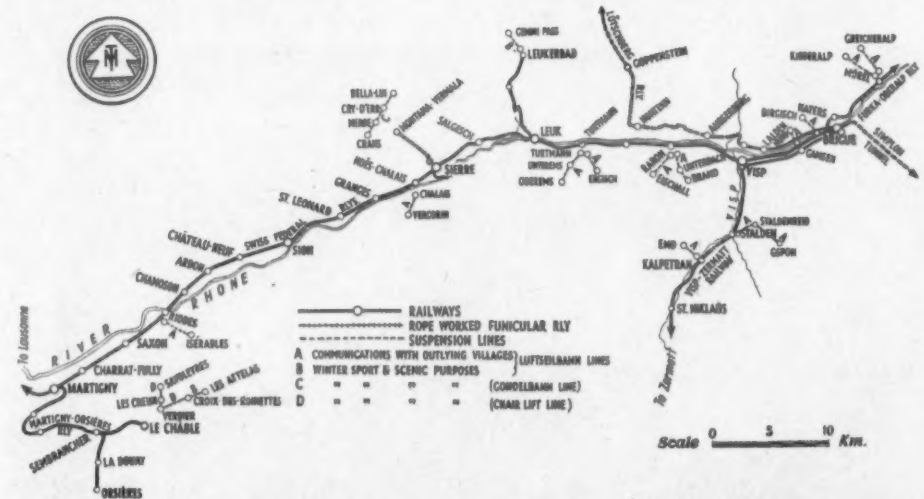


(Left) The high-altitude Luftseilbahn from near Pontresina to the Diavolezza, 9,764 ft. above the sea, 3,964 yd. long and with cabins carrying 50 passengers. (Centre) A 3,150-ft. cable span on the Sântis Luftseilbahn, with a cabin holding 35 passengers. (Right) The cables of the Champéry—Planachaux Luftseilbahn—for each line doubled supporting cables, haulage cable, cable for braking in emergency, and telephone cable

requires no permanent way; there is no need to work round the mountain contours in order to preserve evenness of gradient, but a perfectly straight course can be followed; it is not necessary to build any bridges or tunnels. Quite on the contrary, if the suspension route is intersected by a valley, the cables can be swung straight across from one side to the other, and the spans of the most recent lines have become progressively more daring. As to capacity, some of the latest chair-lifts can carry passengers in each direction at a rate of up to 450 an hour, which is greater than the carrying capacity of any of the longer rope-worked or funicular railways. It is almost impossible for a heavy snowfall to cause the stoppage of the service on a suspension line, and it is seldom necessary to provide any avalanche protection works for lines of this type. In general, also, a smaller operating staff is required for aerial than for railway transport.

Chair-Lifts

Suspension lines are of various types. The simplest to build and the cheapest to equip is the single chair-lift, developed from the ski-lift. In this a single endless rope, to which the chairs are permanently attached, serves both to carry and



The location of 16 suspension lines in the Rhône valley between Martigny, Brigue and Mörel

the moving haulage cables at the terminals, in the usual way, so that passengers may enter and leave them while they are at rest. On the third or uppermost section of the line, however, a different principle is in operation. At fixed intervals the haulage cable has a series of substantial hooks depending from it; there is no independent supporting cable. When passengers have entered a stationary cabin, it is pushed to the end of the runway, and the next hook on the moving cable engages with an eye above the cabin, so swinging the latter into motion; there is automatic disengagement as the other terminal is reached.

Considerable Heights

With chair-lifts, as the only protection to passengers from falling out is the small safety arm that latches across the front of the chair, it is seldom that the chairs move at any higher level from the ground than 20 to 30 ft. But with the *Gondelbahn* type of line, in which passengers are completely enclosed, the cars often move at considerably greater heights and over much longer cable spans. Another *Gondelbahn* over 3 miles in length, second only to that from Zweisimmen to the Rinderberg, is that which runs in two sections from Kriens (Lucerne) to Fräkmüntegg, 4,968 yd. in length, terminating immediately below the great cliffs of the mountain Pilatus, to which the ascent is completed by a daring Luftseilbahn. After the three-section Crans-



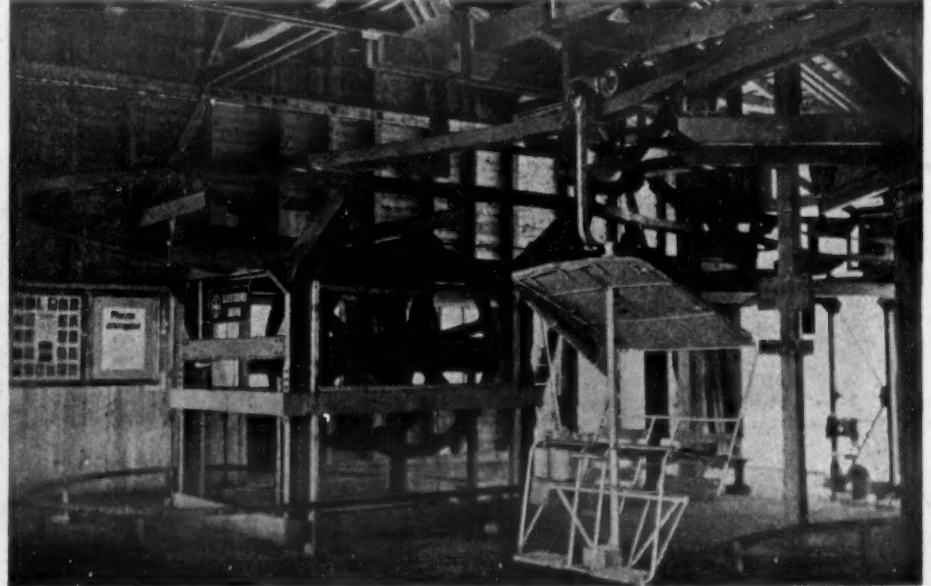
(Left) Ascending and descending single chairs, permanently attached to the moving cable; on the Stoos—Fronalpstock chair-lift; and (right) double chairs on the Beatenberg—Niederhorn chair-lift which detach from the cable at the terminals

to move the chairs, and passengers, with the help of an attendant, enter and leave the chairs at the terminals while the latter are in motion. Developed from the single is the double chair-lift, with which the normal practice is to provide semi-circular runways at the terminals on which the pairs of chairs can come to rest. On release of a pair, the guiding pulleys at the top of the arm from which the chairs are suspended run slowly downwards

maintained between each pair, that is, at a minimum interval of 16 sec.

The Gondelbahn

A disadvantage of almost all the chair-lifts is the lack of protection of the chairs from the weather. Single chair-lifts in general have no protection; double chair-lifts have a canopy and no more. This lack has led to the development of the *Gondelbahn*,



A junction station of the Luftseilbahn from Beatenberg to the Niederhorn. The switches are down and the pair of chairs is moving across from the right-hand to the left-hand semicircular runway

cars while they are in motion, but at a very low speed; on the journey it is necessary for passengers to get accustomed to the constant deceleration and acceleration of the progress as successive pairs of cars pass through the stations.

A Variant

Another variant is found on the 4,916-yd. *Gondelbahn* from Crans-sur-Sierre (Montana) to Bellalui,

Bellalui *Gondelbahn* there come two notable lines in the upper Rhine valley, each of two sections, the 3,822-yd. line from Bad Ragaz to Pardiell and the 3,239-yd. line from Wangs (Sargans) to Furt. The Bad Ragaz—Pardiell line lifts its passengers through a difference in level of 3,677 ft. and that from Wangs to Furt through 3,481 ft.; both are continued by chair-lifts which add 1,935 ft. and

(Continued on page 6)

LORRY—BUS—COACH

London Busmen Seek End of Overtime

BAULKED in its original intention "not to co-operate in any way" with London Transport in the implementation of the current service economy measures, the London busmen's negotiating committee this week modified its plans and produced a seven-point work-to-rule campaign for recommendation to union members. Also, on Monday a delegate conference of Central area men decided to call for amendments to the present agreement covering service with London Transport so as to reduce the standard Monday-Friday working day from 8 hr. 15 min. (including a maximum of 35 min. scheduled overtime) to 7 hr. 40 min. and to make the standard day 6 hr. 40 min. on Saturday and Sundays. The average scheduled fortnight's work for the whole Central area fleet, they demand, should not exceed 80 hours instead of 90½ hours at present. In other words, they want to ban scheduled overtime. These proposals go next to the negotiating committee. What the busmen expect to gain from these moves is not clear; with the present staff shortage it is unlikely that the present 9 per cent service cuts will result in any loss of earnings.

Oxford Street Store Suffered from Strike

FOR the first six months of the current financial year, which included the seven-week London bus strike, turnover of London stores in the John Lewis group dropped by 3.4 per cent, compared with an overall increase of 4 per cent in the provinces. Included is Selfridges store in Oxford Street.

Birmingham Bus Overhaul

EXTENSIONS are to be made to the Birmingham City Transport bus overhaul works at Tyburn Road, Erdington. They will enlarge the works by about a quarter. Built in 1929, the depot was extended in 1938. It was then foreseen that a further extension would be required when the changeover from trams to buses was completed.

Labour, Unions and Transport Policy

LEADERS of the Labour Party and trade unions this week discussed the finances of the British Transport Commission at a meeting of the joint committee which they set up several years ago to deal with the subject. The finances are being dealt with in relation to general transport policy, including the method of rationalising road haulage, C licences, buses, investment levels and general considerations regarding freight charges and fares. These matters were reviewed by the National Union of Railwaymen at the request of the Trades Union Congress and were understood subsequently to have been commented upon by the economic committee of the T.U.C. It is obviously felt necessary to evolve a common approach to these affairs.

Bad Year for Southport

A "MOST alarming fall" of £20,517 in Southport Corporation bus receipts, a loss of £31,350—the heaviest in the department's history—and a deficit carried forward of £28,197, are disclosed

by the transport manager, Mr. Jackson Hoggard, in his report for the year ended March 31, 1958. The total expenditure of £265,060 exceeded income by £5,146, and net loan charges absorbed £26,204. The chief cause of the financial deterioration was the decline in traffic receipts. Alterations and economies reduced mileage operated last year to 2,134,664—a drop of 132,537. The decline in the number of passengers continued, the year's total being 19,298,215—a reduction of 1,910,130. Mr. Hoggard in a warning says: "Despite the fact that the fares were revised last January, the prospects for the future are not good. Should the new fares produce the estimated additional revenue, the amount will still not be sufficient to enable a profit to be made this year,

Justice, Mr. O. Traynor. It urged the appointment of full-time mobile officers from the department—on a preliminary basis of one officer for each county—whose sole duty would be the enforcement of transport legislation against unlicensed road hauliers. Mr. Traynor promised to consider the suggestion.

Stylish Fleet for Frozen Foods

SOME striking new vehicles are going into the road distribution fleet of Birds Eye Foods, Limited, the Unilever frozen foods company. Pride of place is taken by an E.R.F. 68G eight-wheeler with Mann Egerton refrigerated body. The vehicle battery capacity has been increased to cater for the increased load of electrical equipment to 230 amp. hr. while the dynamo is capable of a 30 amp. charging capacity. Particular attention has been paid to the standard of comfort and fitments in the driving cab. The seats have been finished in blue leather, whilst all panelling has been finished in light and dark blue leather. The external appearance of the vehicle has been designed by P.L.A.N. International with the co-operation of

fugal fans. Six evaporating units, each designed to hold 100 lb. of dry ice, are placed in pairs inside the vehicle. The thermal efficiency is rated at 61 per cent. A huge tonnage of Birds Eye foods has to be moved each week, long routes have to be covered and goods must arrive in perfect condition. To ease the marketing problem, cold stores are sited at strategic points through the country from where food is again re-routed to over 40 tactical cold stores in further areas, which, in turn, deliver daily—or never less than thrice weekly—to local retailers. The E.R.F. vehicles will therefore provide shuttle services; the other Ford and Austin vehicles illustrated on this page will make calls on retailers and carry out display and general duties.

Apartheid on Cape Town Buses

MORE than half (33 out of 60) of the bus and trolleybus routes in Cape Town and its suburbs covered by the City Tramways Co., Limited, now have some form of apartheid on instructions from the National Transport Commission. On the three latest routes apartheid restrictions are not enforced during peak hours.

Dundee Maintenance Shop Troubles

BAD workmanship had resulted in unnecessary and additional outlays by the department through the waste of material, Mr. W. L. Russell, general manager of Dundee Corporation Transport Department, told his transport committee and union representatives. Since introduction of a bonus system, time taken to carry out some jobs had lengthened instead of shortened. Men might earn a bonus when they were actually taking longer to carry out work than formerly. Any changes or economies considered necessary in the department were invariably resisted. It was agreed at a joint meeting that indiscipline and bad workmanship should be dealt with at workshop level, as also the effects on the bonus scheme.

Ceylon Board Inquiry

A COMMITTEE to investigate the finances of the Ceylon Transport Board is to be appointed by the Government. This follows a proposal of the Minister of Finance who has expressed dissatisfaction with the accounting and handling of finances granted by the Government to the Board. The Board has requested a further loan of Rs.42 million (£3,110,000) and an annual subsidy from the government. The government has decided that it is not expedient at this stage to consider the request made by the Board to standardise bus fares. Further, seven hundred buses operated by the Board have no right to be on the roads—the sizes, shapes and dimensions do not satisfy the specifications required under the Motor Traffic Act. The Board has only now applied for exemption from this section of the Act. Included are 24 trailers.

Bus and Coach Developments

H. Patching, Cadeby Old Village, Doncaster, seeks the Great Houghton—Little Houghton service of H. Brooke and Son. B. Gillard, Altofts, Normanton, applies for the Wakefield—Hales Mill workpeople's service of Knowles Coaches (F. Knowles). Devon General Omnibus and Touring Co., Limited, proposes a service between Paignton and Galmpton via Goodington and Churston. If granted the licence for the Paignton—Greenway service (18) would be surrendered.



Four types of vehicle, E.R.F. eight-wheeler, Ford 4D diesel 2½-tonner, Austin A152 Omnivan and Austin A55 10-cwt. van, introduced into the Birds Eye frozen food distribution fleet (see paragraph)

especially as the expenditure will certainly be greater. The last two fare increases have resulted in heavy falls in passengers and have proved unsuccessful." There would, however, be a reduction in loan charges for the next few years.

Eire Hauliers Invite Enforcement

WHEN Mr. Sean F. Lemass, Eireann Minister for Industry and Commerce, recently received representatives of the National Council of the Licensed Road Transport Association at the Department of Industry and Commerce in Dublin problems affecting licensed carriers generally and in particular the position following the enactment of the Transport Act, 1958, were discussed. The Minister informed the deputation that he had arranged for a systematic examination of existing road transport licences and indicated the decisions he had reached.

A joint deputation of the Public Transport Development Association and the Licensed Road Transport Association also met the Minister for

Richard Lonsdale-Hands Associates, Limited. The insulated body is capable of carrying 14 tons of quick frozen foods, maintaining a product temperature of 0 deg. F. over a period of 24 hours using solid carbon dioxide as a refrigerant. It is intended to use the vehicle for palletised goods (ten pallets). The internal dimensions of the container are 7 ft. 10 in. by 7 ft. 1½ in. by 22 ft. 9 in.

Insulation is 4 in. of expanded polystyrene (Isocolor) on the walls and roof and 3½ in. on the floor; 1½ in. dunnage is provided on the walls and doors to ensure full air circulation around the product. Double doors are provided which are fully vapour and heat proofed and open the full width. Inner and outer skins of the body are aluminium alloy, the outer skin being fully vapour proofed. Heavy duty alloy planking is used in the floor in order to withstand point loading of 2,080 lb. from pallet truck wheels. There is no metal connection made between the inner and outer frameworks, Jabroc spars being used.

A closed circuit CO₂ evaporation system of refrigeration is employed, controlled by six centri-



The Fairey Rotodyne, the world's

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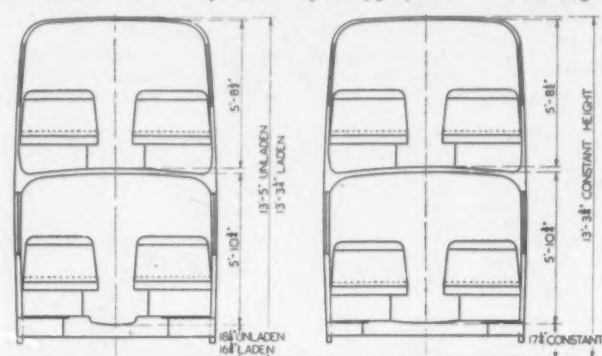
The BRITISH ALUMINIUM Co Ltd



NORFOLK HOUSE ST JAMES'S SQUARE LONDON SW1

SINCE its introduction in the autumn of 1949 some 1,500 vehicles of the Bristol Lodekka type have gone into service with the Tilling and Scottish Omnibus companies of the British Transport Commission and the design is also the basis of the Dennis Loline bus, first introduced at the Commercial Vehicle Show of 1956. It offers a means of getting a low-height bus able to pass under comparatively low railway bridges, without the need of special seating arrangements in either saloon, as will be seen from the diagrams reproduced.

During the eight years since its first production by Bristol Commercial Vehicles, Limited, a number of improvements have been incorporated in transmission and general arrangement of the Lodekka, and at the end of last year a few prototype 70-seat



The flatter floor and constant height characteristics of the new LDS-type air-sprung Lodekka (right) are well shown by this comparison with the left-hand section of an LD type

models were produced with an overall length of 30 ft. The standard model is, however, 27 ft. long. The latest developments of this vehicle include a "flat floor" model, result of careful refinement of underframe and body design, and a layout which enables either orthodox leaf spring suspension or air bellows on a broad base to be incorporated. The latter gives such a delightful ride that, although the leaf spring running is good, we believe many managements will want the attraction to passengers of the rather more costly pneumatic suspension.

New Floor Level

One of the drawbacks of the original design was the necessity of having a sunken gangway which was about 4 in. to 5 in. below the level of the seat floor. To overcome the troubles, such as occasional difficulty of the conductor passing standing passengers, caused by this sunken gangway, the Lodekka vehicle has been redesigned and it is now possible to produce it with a flat floor. Two prototype vehicles have been constructed, one 27 ft. long for Crossville and the other 30 ft. These will shortly be put into service for operating experience.

On a 1956 model Lodekka, with Eastern Coach Works body, the gangway was only 18 in. wide at

its narrowest part and there was—in addition to the big step up between the longitudinal seats at the rear—a 5-in. step up at the front end of the gangway to reach the front transverse seats or the five-seat cross-bench facing backwards at the front bulkhead. The new one has a 21-in. wide gangway at the narrowest section between the covers of the rear wheel drives, where there is a box 8½ in. high, but among the transverse seats the floor runs smoothly from between the seats into the gangway. A slight dishing of the gangway has, however, been made to give a 2-in. advantage. The rear facing seat approach is also practically level. The improved layout enables longitudinal seats to be provided where formerly it was desirable to put a luggage space, so that a 27-ft. bus capacity inside has gone up from 25 to 27. The upper deck carries 33 seats in each case, giving a total increased from 58 to 60. To assist in the provision of the flat floor the frame depth has been slightly reduced and slight modifications have been made in the bodywork, which is now integral with the frame as a load structure. The silencer is made oval so as to give the maximum ground clearance.

The standard production vehicles incorporating the new flat floor will have the orthodox semi-elliptic leaf spring suspension fitted, but the design is such that air springs can be supplied as an alternative when required. With this air suspension system on the rear axle, the overall height of the vehicle and also the rear platform is kept at a constant level, whether the vehicle is unladen or fully laden. The air springs having constant periodicity characteristics, give a greatly improved and softer ride, and also reduce the road shocks transmitted to the chassis and body. In the construction of the chassis, the wheel boxes form the structure that carries the upper portion of the air suspension units. The lower portion of the air spring is attached to a transverse crossmember which is rigidly attached to the rear ends of two trailing leaf type flexible beams of ½-in. plate.

These flexible beams are fixed at their centres to the rear axle casing, and at their forward ends they are attached through eyes to the crossmember at the front end of the wheel boxes. As the air springs are spaced more widely apart than is possible with orthodox semi-elliptic leaf spring suspension systems, the general stability or resistance to roll is greatly improved.

FLAT FLOOR LODEKKA

Ingenious Bristol-E.C.W. Bus

SOON AVAILABLE WITH AIR SUSPENSION

A Panhard rod for lateral location of the back axle is fitted, one end being attached to the transverse suspension crossmember and the other end coupled to the rear crossmember of the chassis. This unit is placed transversely and the end attachments are fitted with rubber type bush housings; it acts to a limited extent as an anti-roll device.

Air Springs

A special reservoir is supplied for the compressed air used in the air springs. The pressure of this compressed air is 110 lb. per sq. in. From this reservoir, the air passes through a filter to the levelling valves. One valve is fitted to each side of the main chassis and is connected to the axle by adjustable links. The levelling valves will pass no air in either direction while the operating lever remains in a horizontal position. As the load increases, the levelling valves admit air to the air springs from the reservoir and as the load decreases, the control valves exhaust air to atmosphere, thus maintaining the vehicle at constant height.

In all cases the body will return to a position horizontal to the axle under all conditions. This system provides a constant periodicity of approximately 90 cycles a minute. Firestone units are being used on the first air-sprung prototype, on which we were able to see the action of the air suspension over rough road between Brislington, Keynsham and Wansdyke House crossroads on A39; very few shocks were unabsorbed even at high speeds. The second bus will have André equipment. Girling dampers and Westinghouse brakes are employed. The air brake is a natural corollary of the air spring and in any event it is Bristol practice to fit it on 30-ft. vehicles in which gross weight may be nearly 13 tons.

Bodywork Changes

When attention was being given to the body design to provide an improved flat floor, the whole construction of the chassis and body had to be carefully considered. Briefly, the depth of the main chassis frame side members had to be somewhat reduced. The rear wheel arches were extended to the waist rail height, so as to be used as load-carrying members. It was also arranged that the rear body platform construction should be carried by the main body instead of the usual drop channel member extensions. Other items of design improvements include the following.

There is a large reduction in the amount of timber used in the body. Timber longitudinal rails for the fixing of outer panels have been replaced by aluminium alloy extrusions of special section, and the timber packings of the pillars for panel fixing are also now avoided. The intermediate floor is in one-piece plywood in place of tongued and grooved

softwood boards. The rear platform floor is of aluminium sheet in place of tongued and grooved boards. The staircase is of all aluminium construction. An extension has been made of the use of glass fibre mouldings. The used ticket box in the staircase, the block for the conductor's mirror in the staircase, the support for the transverse seats immediately in front of the rear wheels, including the armrests, and other mounting brackets and blocks for rear lamps and other useful items are now moulded in this useful material.

Miscellaneous

An improvement has been made in the interior lighting by an increase in the number of lamps. All lighting and bell cables are carried in aluminium conduit tubing. All ventilators are now of the hopper type, of E.C.W. design and manufacture, in



Frontal appearance of new LDS 60-seat 27-ft. Bristol Lodekka; each side of the destination boxes are the Cave-Browne-Cave heating and ventilation system intakes

place of side sliding windows, themselves an E.C.W. innovation. Draughtless ventilation is thus afforded the passengers. Provision is made for Cave-Browne-Cave heating and ventilation if required by operators. Roof handpoles are now fitted in the lower deck over the gangway by the longitudinal seats.

Entrance doors on the rear platform have been redesigned. Doors are hung on heavy duty phosphor-bronze hinges of E.C.W. design, in place of the continuous "piano hinge" previously used. The bottom track for the door runners has been dropped, thus eliminating difficulties with snow on the platform edge, and the door is now hung from the top track by a ballbearing carriage. The emergency exit on the rear platform has been reversed, so that the direction of persons leaving the vehicle is now towards the nearside.

Paints Technical Service

NEW I.C.I. LABORATORY AT SLOUGH

A NEW technical service laboratory building has been erected at Slough to provide the paints division of Imperial Chemical Industries, Limited, with facilities for giving comprehensive technical service to its customers. This service includes advice on painting specifications and techniques of application, demonstrations to customers and the training of the painting operatives. Practical trials of new products and new techniques are also carried out in the new building. Closely linked with the technical service department is the colour advisory department, where specialists advise on the use of colour and prepare colour schemes to suit individual customers' requirements. The new building was designed as a main single-storey laboratory block with a two-storey administration wing, the latter housing the managerial and administration staffs of the technical service department on the ground floor and the colour advisory department above.

In the new laboratory, all the different sections of technical service at Slough will be housed under one roof for the first time in the history of the division. The greatly improved equipment will provide the paints division with what is almost certainly the most outstanding paint-service laboratory in this country and possibly even in the world. The technical service staff of the paints division has been greatly augmented during the last few years and has been reorganised under four section heads. The new organisation and equipment will make it possible for the division to expand its service to customers. For example, demonstration facilities will be greatly improved; visitors to one section will be able to see the demonstration of the paint or process in which they are interested under some-thing approaching ideal conditions.

Interesting Building

The building itself is of considerable interest architecturally, having several features that are quite new. There is a main block, roughly 210 ft. by 120 ft., which houses the various practical sections of the department, each in its own separate section of the main building, as well as an oven-room section and a large store room. There are two rooms intended specially for trainees—one for industrial and transport customers and one for the decorative and marine fields. In addition, there is a lecture room holding about 30 people which will be used for trainees as well as for the showing of industrial films to customers.

At one end of the building is a semi-covered area about 14 ft. deep running the width of the block, in which particularly dirty operations can be carried out without upsetting the cleanliness of the main space. This area includes an enclosed room

for burnishing wood finishes and another for the preparation of plaster panels.

The main block is brick-built with a single-span roof supported by prestressed concrete girders which, at the time of their manufacture, were probably the largest of their type made in the country. The whole of this block is ventilated by

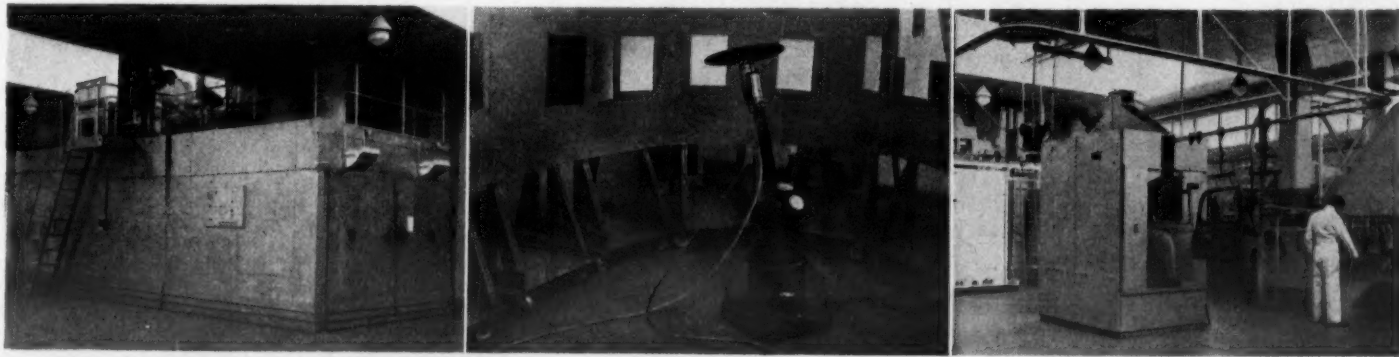
of the more common north lighting found in factories. For any colour matching that may be required a special booth is situated in the refinish section, utilising artificial "daylight." A decorative feature of the exterior of the main laboratory block is the Kynalok aluminium cladding which is used in the top half of the exterior. This covers the air-



I.C.I. paints division's new technical service laboratory at Slough. The huge studio-light window at the right forms the north wall of the colour advisory department

means of an elaborate air-heating and filtering plant situated in an enclosed gallery running the length of the roof and designed to maintain a slight positive pressure throughout the building. A supply of warm filtered air automatically replaces

conditioning plant and intake filters in the topmost gallery and also forms a parapet at the top of the brick walls which hides all but the top of the lighting monitors as well as the ducting from the spray booths.



An oven forming part of a totally enclosed unit in which a large car body can be sprayed in dust-free conditions and then passed directly into the stoving oven; a Ransburg No. 2 electrostatic sprayer using a disc (as shown) or bells occupies a separate room with a mechanical conveyor that can take panels up to 3 ft. by 2 ft. in size; and, extreme right, a conveyor and three different types of radiant-heat ovens are in general use in the oven room

that drawn from any of the various spray booths, so maintaining an excess pressure all the time which prevents the entrance of unfiltered dusty air into the premises.

Novel Lighting

The building is lighted in a novel manner by means of monitors which stand proud of the main ceiling and allow light through their vertical sides but not through their flat tops. This means that a mixture of north and south light is used instead

At the north end of the building is a two-storey wing measuring 100 ft. by 45 ft. of which the spectacular studio-light window is the outstanding feature. The ground floor of the wing comprises the entrance hall, a combined reception and show-room, and the administrative offices of the department. Upstairs is devoted to the colour advisory department whose main room is dominated by the enormous north light. The decorations of the interior of the laboratory, and in particular its colour schemes, as well as its modern functional

furniture have been designed by the colour advisory department which will in future be working in a particularly fine example of its own work.

An interesting feature is the use of the multitone staff-location system for contacting members of the laboratory staff who will normally be working at a distance from a telephone. This is a radio-like apparatus operated by the telephonist in the reception hall who has only to press the appropriate button when a call is received from a customer who wishes to speak to a representative in the laboratory.

Technical Service Laboratories

The technical service laboratories comprise four main sections covering pretreatment, industrial finishes, transport finishes and decorative and marine finishes. In the pretreatment section, I.C.I. materials for the proper preparation of metal before the application of paint can be demonstrated on customers' own articles and panels are also treated for the other departments of the paints division. There is a well-equipped laboratory for the trial of new processes as well as degreasing plant and numerous tanks and cabinets for normal and experimental use. The industrial finishing section, which deals with all manner of manufactured goods other than transport vehicles, comprises a main application shop, with separate rooms for flow coating and electrostatic spray application, an oven room with various stoving devices and separate room for the training of operatives and for wood finishing.

The transport section deals with work for all types of road and railway vehicles both on the manufacturing and maintenance sides. It comprises two separate rooms, one dealing principally with cars, equipped for both cellulose and synthetic finishes, and the other for the trial of air-drying synthetic paints used on buses and coaches. The section also has electrostatic equipment and investigates all new types of equipment put forward for vehicle finishing. The decorative and marine section provides technical service for and practical evaluation of all paints used in every kind of building and structure and for ships and boats. This section also has its own training room, which is equipped with facilities for spray, brush and roller applications.

Although housed in the same building, the colour advisory department has a largely independent function in the encouragement of good painting by choice of colour. The main work of the department consists of the preparation of colour schemes but it is also responsible for organising talks on colour to invited audiences and for the preparation of advice on colour usage for the general public.

Aerial Alpine Transport

(Continued from page 3)

2,093 ft. respectively to the heights already attained.

We come now to lines of the *Luftseilbahn* or téléphérique type, which in general are more substantial and more costly to build than a chair-lift, though still considerably cheaper than a railway. In its operating principle, a *Luftseilbahn* resembles a rope-worked funicular railway, in that it has two cars only, connected by a common haulage cable, so that the weight of the descending car helps to

From Unterterzen, on the Walensee in north-eastern Switzerland, the upper section of the two-section *Luftseilbahn* to Tannenbodenalp has a clear span of 4,341 ft., traversed by cars carrying 45 passengers. On the line from Kandersteg up to Stock, in the Bernese Oberland, the clear depth below the cars before they pass over the first cliff at the head of the valley is 1,155 ft. It need hardly be added that to the uninitiated tourist the first

the summit of the Brienz Rothorn, with a total ascent of 5,515 ft., which has operated under somewhat precarious financial conditions since 1892 with steam power, is not to be electrified, but is to be abandoned and replaced by a *Luftseilbahn*. As compared with the windings round the mountain contours which have been necessary to preserve the 1 in 4 ruling gradient of the railway, the suspension line will be able to pursue a far more direct course, with an inclination of 1 in 1½ or steeper; it will probably cut the present journey time of 55-59 min. to 25 min. or so, will be able to give continuous service and will be operable by a reduced staff.

It is also of interest that the well-established *Luftseilbahn* from Gerschnialp to Trübssee, above Engelberg, has become so heavily patronised in winter that a second line is to be built alongside the first, the combined capacity of the two to be about 750 passengers an hour. The second line also will provide for uninterrupted service while the first is under inspection or repair, and vice versa.

Communal Lines in Switzerland

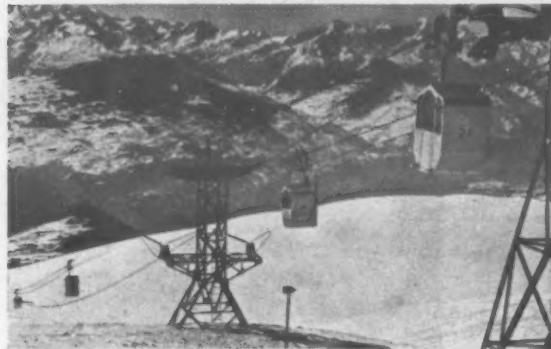
Mention has been made earlier of the suspension

perous villages on the shelving pasture land high above the valley have now been made accessible in this way.

One of these lines, that from Riddes up to Isérables, has been fitted with loading platforms at each terminal, under the cars, which make it possible to sling a Jeep loaded with produce under one of the cars, and to bring it down bodily into the valley, often with its driver sitting unconcernedly in it while being swung over the vast depths beneath the pylons. Between Riddes and Brigue on the Swiss Federal Simplon main line, including the first few miles of the Visp-Zermatt Railway, there are now eight such lines, and farther up the Rhône valley there are five more communicating with the Furka-Oberalp Railway. Such facilities, inexpensive to build and operate, are changing the pattern of life in a number of Swiss mountain villages.

Fate of Pioneer

It is curious that the first of all Swiss suspension lines—the so-called Wetterhorn lift—was opened as far back as 1908, but no longer exists. It yielded



(Above) A winter view of the Gondelbahn from Crans to Bellalui, above the Rhône valley, with four-seater cabins, and (right) the new Gondelbahn from Zweisimmen to the Rinderberg, the longest in Switzerland, with cabins seating two passengers



balance that of the car making the ascent. As compared with a chair-lift providing continuous service, the *Luftseilbahn*, with only a single cabin ascending and a single one descending at any one time, is more restricted in carrying capacity, though on the lines now being built the cabins are increasing progressively in size.

A number of lines use cars holding 40 standing passengers; the lower section of the line from Arosa up to the summit of the Arosa Weisshorn has cabins accommodating no fewer than 60 passengers while the upper section goes further with cars holding 75. With six trips per hour this capacity could equal the 450-passengers-per-hour transport of chair-lifts like that from Grindelwald to First. On the other hand, many of the smaller semi-private *Luftseilbahn* lines are equipped with cabins holding not more than four to eight passengers.

Lengthy Cable Spans

On the lines with the bigger cars the main supporting cables of each line are doubled; as on the long spans the chief strain on each cable is that of its own weight, stress problems are simplified in this way. The cable spans of some of the more modern lines are daring to a degree. Distances of over 3,000 ft. between pylons are common. The Swiss record is now held by the line from Leukerbad to the top of the great cliffs of the Gemmi Pass, with an uninterrupted span of 4,456 ft., beating even the 4,400-ft. span of the French line from Planpraz to the summit of the Brévent, above Chamonix.

experiences on such lines are of a breathtaking description.

Extending Existing Mountain Railways

Such is the increasing popularity of skiing that a number of the latest *Luftseilbahn* lines further extend the high-level journeys already made possible by rack-and-pinion and funicular railways that have been in use for a good many years. For example, there is just being completed a two-section line from the terminus of the Gornergrat rack-and-pinion railway, at 10,134 ft. altitude, for nearly 2 miles along the same ridge to the summit of the Stockhorn, 11,178 ft., immediately facing Monte Rosa. From Weissfluhjoch, the 7,857-ft. terminus of the Parsenn funicular from Davos, a single-span line has been thrown across the deep intervening valley to the summit of the Weissfluh, 9,262 ft. up. Again, from Corviglia, upper terminus of the two-stage funicular from St. Moritz, there is now a *Luftseilbahn* to the top of the Piz Nair, 9,941 ft. altitude. Yet another new suspension line in the same region, which has made readily accessible the spectacular Diavolezza Pass, in the heart of the ice and snow of the Bernina mountain group, starts from a new station on the Bernina Railway; with its 3,964-yd. length this is the longest single-section line of this type in Switzerland, and it finishes at an altitude of 9,764 ft.

Brienz Rothorn Replacement

In this connection it is of interest that the 4½-mile rack-and-pinion railway from Brienz to



(Left) One of the cabins of the *Luftseilbahn* from Riddes in the Rhône valley up to Isérables, from which a loaded jeep is suspended; and (right) a 35-passenger cabin, with built-out attachments for carrying skis or hotel supplies, on the line from Gerschnialp to Trübssee, Engelberg, which is shortly to be doubled



lines which have been built by high-lying villages in order to give them direct communication with the railways in the valleys, in place of the mule-tracks or rough and steep roads which were their only previous access. Many of these lines have been built under cantonal rather than federal concessions, and do not figure in the public timetables, though they operate at fixed times. The greatest concentration is found along the length of the Rhône valley, where a whole string of the pros-

to few of the later lines in the daring of its conception; designed to give access to a path leading to the Gieckstein club hut on the mountain, it swung in a single 1,320-ft. span from the lower terminus to an upper terminus on the precipitous west face of the mountain, 1,380 ft. above, at an average gradient of 50 per cent and a maximum inclination not far short of vertical. But six years later the line was damaged by avalanches, and was

(Continued on page 10)

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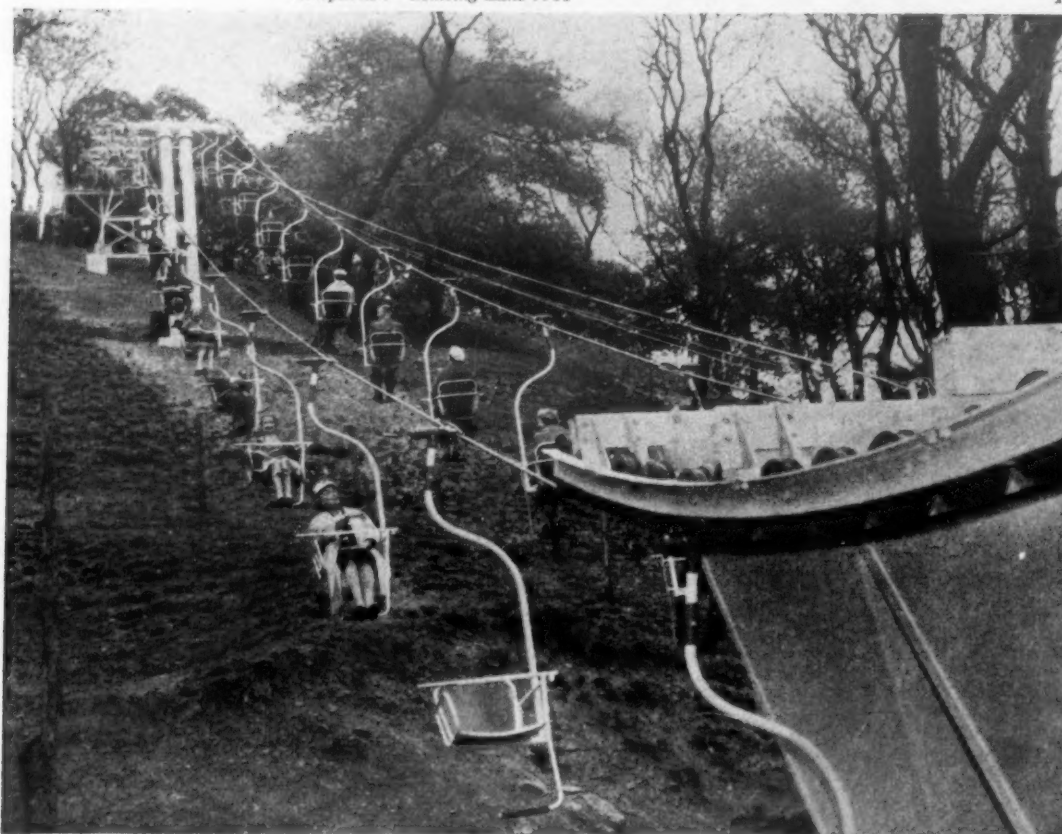
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Chairlift at Dudley Zoo

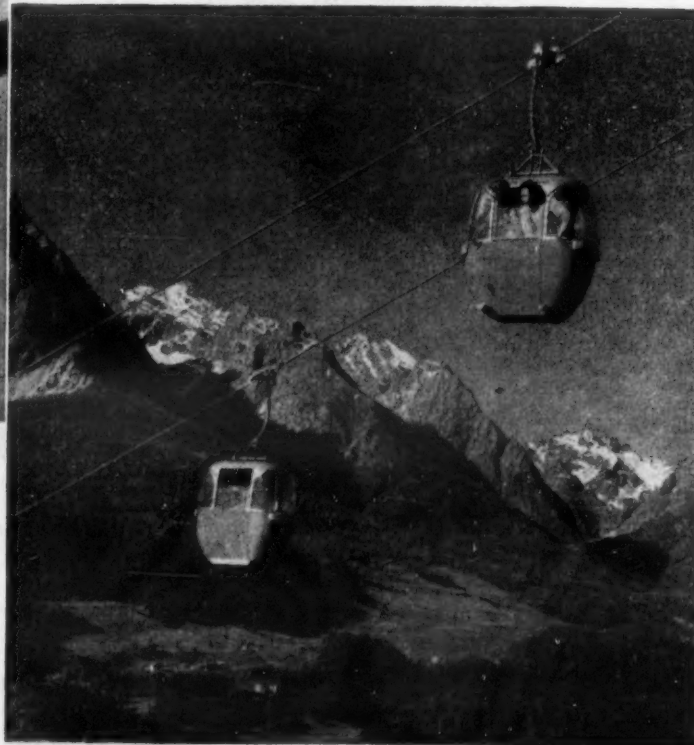
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RAILBUSES FOR BRITISH RAILWAYS

Park Royal and Bristol-E.C.W. Designs (Cont.)*

BODY structure and suspension of both the Park Royal and the Bristol-E.C.W. railbuses now delivered to British Railways exhibit features of considerable interest. In the Park Royal units the principle adopted for the main body suspension necessitated the use of a separate integrally constructed body; the body framing is based on a welded steel channel section body underframe which, combined with the stressed bodysides and roof structure, results in a self-supporting box structure of the necessary rigidity. To this are mounted four triangulated suspension brackets, positioned to clear the four outer corners of the main power underframe, and having their thrust faces set at 45 deg. to the underframe top face. Located on these faces by two dowels are the top reaction and location plates of the main suspension coil springs, the bottom ends of which are located in similar plates carried on threaded eye bolts passing through the spring and body bracket and

BRISTOL-E.C.W. DIMENSIONS

Length over bumpers	42 ft. 7 in.
Length over end panels	42 ft. 4 in.
Width over side panels	8 ft. 10 in.
Inside width	8 ft. 8 in.
Height of floor from rail (laden)	3 ft. 8 in.
Interior clear height, floor to ceiling	7 ft. 8 in.
Wheelbase	22 ft.
Wheel diameter	34 in.
Weight unladen	13½ tons

located in trunnion blocks mounted to the power frame. The vertical body movement on loading is transferred to angular compression of the springs and as the load increases the spring angle more nearly approaches the vertical, thus varying the spring rate to suit increasing load.

Free vertical oscillation is damped by four telescopic hydraulic shock absorbers mounted between body and power frame, and lateral and longitudinal movement is prevented by four Ferobestos faced brackets on the power frame registering inside corresponding box members in the body, clearance being left in the static position. These body stops come into use on braking or acceleration and on sudden changes of direction such as points, cross-overs, etc., and also enable the vehicle to be towed in the event of breakdown.

Body Structure

A requirement of the design is that the body must be a self-supporting unit, carried as it is on four points only. To achieve this, the structure is based on a welded steel channel section underframe



Interior and driver's desk of Park Royal railbus for British Railways

with reinforced crossmembers at the body mounting points. Cast-alloy brackets provide connections for the main pillars to the solebars, the pillars being of robust H-section extruded aluminium alloy. Internally, fitted stress panels of 14-g. aluminium alloy are solid riveted to the framing from seat rail to waist with a ½-in. one-piece alloy cove from seat rail to floor, the vestibule and doorways being formed by floor to cant stress panels. To complete the box structure the roof unit is bracketed to the pillars through the full-length cant rail lower channel. The main roofsticks are of

BRISTOL-E.C.W. RAILBUS SUB-CONTRACTORS

Battery, Exide Drydex Batteries.
Alternator and rectifier, C.A.V., Limited.
Warning horn and windscreen wipers, Trico-Folberth, Limited.
Gearbox and control gear, Self-Changing Gears, Limited.
Pneumatic equipment, Westinghouse Brake and Signal Co., Limited.
Engine, L. Gardner and Sons, Limited.
Monitor disc brakes and Dunlopilo seat filling, Dunlop Rubber Co., Limited.
Rubber suspension units, Metalastik, Limited.
Telescopic dampers, Girling, Limited.
Hydraulic auxiliary throttle control, Automotive Products Co., Limited.
Resilient wheels, Svenska Aktiebolaget Bromsregulator.
Glass, Pilkington Bros., Limited.
Seat frames and sliding door pneumatic gear, Deans and Son (Yorkshire), Limited.
Droplight windows, Beckett, Laycock and Watkinson, Limited.
Heater, S. Smith and Son, Limited.
Moquette, T. C. Firth (1955), Limited.
Saloon lighting equipment, Lewis Dixon, Limited, and E. W. Matthews, Limited.
Drivers' seats, A. W. Chapman, Limited.
Headcode lamps, B.M.A.C., Limited.

top hat section, flanges upward, solid riveted to a shaped cove panel in 14-g. mild steel extending the full length of the roof each side and riveted to the lower cant channel and pillars. The roof exterior panels are of 14-g. aluminium alloy overlapped and double-row solid riveted to the sticks, shaped domes incorporating the destination boxes being fitted each end.

Shaped one-piece end panels in aluminium, incorporate the code lamps and route boxes. The aluminium alloy main side panels, in one piece from doorway to front quarters, are secured to the pillars by coverstrips and blind rivets, after the outer faces of the inner stress panels have been asbestos sprayed, as is the roof interior before the composition roof lining panels and aluminium cove panels are fitted. The floor is formed of corrugated extruded aluminium alloy planking bolted to the main body underframe. This is asbestos sprayed to fill the corrugations and to a depth of about ½ in. over. Then ½-in. resin bonded ply is laid and covered with 3.2 mm. dark blue linoleum. Floor traps are provided over engine, gearbox and final drive to permit servicing from the saloon where necessary.

Seats

Seating is provided for 50 passengers, arranged in a three and two basis each side of the vestibule with the seats facing the end of the car in each half. Bus-type tubular frames are used, with Latex foam cushions and rubberised hair padding squabs.

* Previous portion appeared August 23.

trimmed in blue grey patterned moquette. The interior finish of the saloon is carried out in leather-cloth, blue up to the waist and grey above up to the top of the roof coves, the roof centre being finished in semi-matt grey enamel. The partitions forming the vestibule, and all areas susceptible to kicking or similar damage, have polished chequered aluminium kicking panels fitted up to 12 in. from the floor.

Air-operated single sliding doors provide access to the vehicle; these are controlled by the driver through an electric switch; a warning light on the driver's desk indicates when either door is open more than about ¼ in. All main side windows have double top sliding unit windows with aluminium alloy frames. They are rubber glazed in steel pans. Full drop windows are fitted in each cab and in the saloon the opposite side to the cab window. They are rubber glazed in steel pans. Full drop windows are fitted in each cab and in the saloon

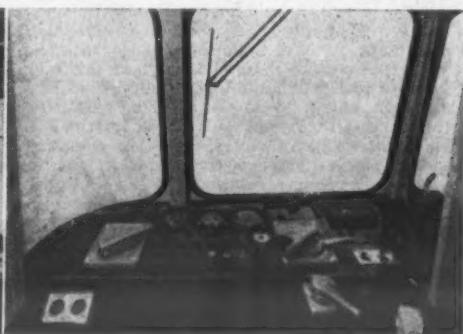
PARK ROYAL DIMENSIONS

Length over body	42 ft.
Length over bumpers	43 ft. 4 in.
Width overall	9 ft. 3 in.
Height overall (unladen)	21 ft. 8 in.
Wheelbase	20 ft. 8 in.
Wheel diameter	30 in.
Tare weight	15 tons

the opposite side to the cab window. They are needed for passing the staff or tablet in single-line operation. Roof extractor vents are fitted, and saloon heating is effected by a combustion type heater feeding recirculated air to ducting along the bodyside with outlets beneath the seats. The heater has its own 10-gallon fuel tank separate from the main fuel supply. Tubular framed net base parcel racks are mounted at cant level throughout, with rubber protection strips on the cove panels; the vestibule provides ample space for heavy luggage, prams, etc. The saloon illumination is provided by 22 open reflector type lamps with pearl bulbs, arranged to give even lighting to all seats. Two lamps can be switched on from the vestibule for cleaning purposes.

Driver's Cab

The driver's position is separated from the saloon by full height glazed partitions, with a hinged door into the saloon. His comfortably upholstered seat is adjustable for height and distance from the controls, and a heater outlet ensures a comfortable temperature, aided by two blower-fed demister nozzles to the screen and shaped quarter light. The



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NEWS FROM ALL QUARTERS

Guarding from the Tender

The constant lack of luggage wagons on the West German Federal Railways is to be eased by a decision of the authorities to make a guard's compartment part of the tender of a locomotive, thus saving a special compartment.

Old Trafford Goods Depot to Close

The London Midland Region has announced that the goods depot at Old Trafford on the Manchester South Junction and Altrincham line will be closed on and from Monday, September 1. Full loads will be dealt with at Cornbrook and Manchester and livestock at Stretford Station.

Independent Inquiry into Railway Wages

It has been decided that the inquiry which is to be made into the railway wages structure shall be conducted by an independent body and not as a domestic matter. A sub-committee is being appointed to consider who should be invited to conduct the inquiry and its precise terms of reference; this sub-committee will meet for the first time on September 9.

By-Pass to Halesowen

Halesowen by-pass was opened on August 1. For many years motorists wishing to travel from Birmingham to Hunnington and Romsley on the south side of Halesowen have avoided the steep and winding Mucklow Hill and the narrow streets of the town to reach the Halesowen—Bromsgrove road. Through traffic between Birmingham and Kidderminster can now avoid Halesowen completely.

Underground Proposals in Swiss Cities

It has been decided to construct an underground railway with an estimated length of 7.3 km. (4½ miles) in Basle. This, it was stated, would be the only solution for the extreme traffic congestion in the narrow streets of the town centre. The suggestion that Zurich should build an underground to ease traffic congestion has received the full support of a working party studying traffic conditions in the old city and the present city centre. The committee has said that it intends to press for acceptance of an underground scheme by the city council most energetically. It deplores the unilateral decision of the city authorities to spend public money on studies of a shallow system, which it says would be unsuitable.

Co-ordination of Regulation in East Africa

A move has now been made, following initial suggestions by the chairman of the East African Road Federation, towards the standardisation of road transport legislation within the territories of East Africa. The East African Transport Commissioner, Major-General W. D. A. Williams, at a meeting convened by the E.A.R.F. earlier this year, reported that an Inter-territorial Road Transport Licensing Consultative Committee had been set up of which he was the chairman and that this body had met to consider the problem. Discussions have since taken place between the licensing authorities of the various territories and further methods of consultation are being worked out. The co-ordination and enforcement of traffic regulations (as opposed to licensing regulations) is being studied.

High and Low Hopes No More

Hope high and low level stations on the London Midland Region, which have existed solely for the exchange of passengers, will be closed on and from September 1, as the traffic no longer necessitates this facility. The station had no road access or exit and no tickets were issued.

Willesden Locomotive Turntable

A new 70-ft. turntable is to be installed at Willesden L.M.R. locomotive depot, replacing one of similar size built in 1928, which has become life expired. When Willesden goes over to electric locomotives in 1968 the turntable will probably be used as a replacement at another depot.

First Toll Road in Canada

Canada's first toll highway, the 30-mile six-lane Laurentian Autoroute in Quebec, is due for completion this winter. Some access points will be built along the route but basically it will serve through traffic. There will be two large and four smaller bridges, underpasses and overpasses, 14 interchange and six cloverleaf junctions.

Eight-Lane Highway for Salisbury (S.R.)

The Salisbury city engineers are putting the finishing touches to the first section of a new arterial highway linking Salisbury Airport and the municipal border with Highlands. The overall scheme provides for an eight-lane highway which will be 165 ft. wide—one of the most ambitious road engineering projects in Rhodesia. The new highway involves two road bridges, a railway bridge and one over the Makabusi River.

North Eastern Stations Closing

Fifteen stations in the North Eastern Region are to be closed to passengers on and from September 15. They are: Otterington, Cowton, Danby Wiske, Leeds Marsh Lane, Hessay, Marston Moor, Hopperton, Goldsborough, Cockfield Fell, Redmarshall, Riccal, Benningbrough, Sessay, Baene, Heck, Killingworth, Lemington, Newburn, Forest Hall, Plessey (halt), Stannington, Chevington, Warkworth, Little Mill, Christon Bank, Goswick, Annitsford, and Heddon-on-the-Wall.

Nyasaland Railways Earn More

Nyasaland Railways earned more in the past financial year, but there was an even greater rise in operating expenses, Mr. W. M. Codrington, chairman of the company, told shareholders in London. Operating receipts amounted to £1,089,924 compared with £1,036,454 in 1956, an increase of 5 per cent. But spending rose from £819,031 to £881,682, an increase of 8 per cent, leaving a net operating surplus of £208,242, compared with £217,423 in 1956, a decrease of 4 per cent. The company had been trying for many years, despite many disappointments, to train Africans for higher posts. Efforts in this direction were continuing. "To pretend that it is easy to inculcate in Africans accustomed to a very elementary standard of civilisation, the necessary skills and, above all, a sense of responsibility, would be grossly misleading," he added. "But we have achieved some progress through our apprenticeship schemes and through the activities of our welfare organisation."

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COMMERCIAL AVIATION

Noise of Jet Aircraft

INQUIRY INTO B.W.I.A.

TESTS carried out for the United Kingdom authorities have shown that suppression in the case of the Caravelle and de Havilland Comet will reduce the impact of their noise so that it is comparable with that of piston-engined aircraft already in commercial use. Meanwhile the further abatement of noise from jet aircraft will depend to a great extent on techniques of operation and therefore on practical experience of the aircraft at British airports. This means an initial period of experiment. It was announced this week by the Ministry of Transport and Civil Aviation that during this period those jet aircraft which have yet to be proved as adequately silenced at source will only be permitted to operate into United Kingdom airports under conditions designed to reduce disturbance to a reasonable minimum. These conditions will include take-off and landing during waking hours only; the use of operating (especially take-off) techniques to reduce noise disturbance to a minimum, and the prescription of noise reducing measures for ground running of engines. Both the general and specific restrictions will be provisional and will be reviewed and modified as necessary in the light of experience. Apart from the Caravelle and Comet already mentioned, jet services into the United Kingdom in the near future have been projected for the Tu104 and Boeing 707.

The Tu104

"As regards the former, the Government has been in consultation for some time with the Soviet authorities in order to solve noise problems so that a London-Moscow service may be operated in parallel by Aeroflot and British European Airways. The Soviet authorities have now informed the United Kingdom authorities that they have developed techniques of operation which will reduce the noise of the Tu104 to that of existing piston-engined types. The Government welcomes this constructive development which accords with the general policy the Minister of Transport has evolved. In reply, therefore, the Soviet Government has been informed of this policy and the general conditions under which the Minister would be able to admit the Tu104 and similar large jets, and it has been asked for fuller details of the Soviet operating techniques in order that precise conditions governing Tu104 services into London Airport may be agreed and so that an early date for inaugurating the Moscow-London services can be fixed. The Government would welcome a Tu104 proving flight into London Airport if that would speed these aims and the Soviet authorities have been so informed."

P.A.A. Approach

Pan-American World Airways approached the Ministry of Transport and Civil Aviation following the Minister's recent visit to the Port of New York Authority for permission to bring a Boeing 707-120 into London Airport during September for a period of experiment with operational procedures and noise tests, followed by a first trial flight, and proposed certain restrictions. Subject to these trials confirming the suitability of these restrictions, P.A.A. asked permission to follow them with a number of crew training flights under the same conditions or modified as the trials might show necessary. The restrictions proposed were: operation during waking hours only; good weather operations only; no operations with the aircraft exceeding 190,000 lb. gross weight; and the aircraft at all times to be operated in such a way as to minimise the effect of noise.

No fare-paying passengers will be carried on either the trial flights or the subsequent experimental series. The Minister has agreed to this request and has welcomed the opportunity it will afford to develop his policy in the light of practical experiment. P.A.A. has recently been given permission to make 30 days trial flights with the Boeing 707 at New York International Airport under similar voluntary restrictions, allowing for local circumstances. The Port of New York Authority has agreed to make information from these trials available to the Ministry.

Inquiry into B.W.I.A.

Organisation and methods of British West Indian Airways (an associate of British Overseas Airways Corporation), which has had deficits in recent years, are to be reviewed by Air Commodore G. J. Powell, the former managing director of British Aviation Services, Limited. In a statement, B.O.A.C. and West Indian Airways said that all the departments and establishments of B.W.I.A. are to be reviewed and that later Air Commodore Powell is to make recommendations to the boards of B.W.I.A. and B.O.A.C. Associated Companies (the company formed last year with special responsibility for B.O.A.C. interests in subsidiary and associated airlines).

Cork Airport Progress

It was announced on August 25 that tenders had not yet been invited for the construction of Cork Airport at Ballygarvan, but the land was being acquired. It was hoped that the airport would be operating in 1961. A preliminary engineering survey had been carried out, and negotiations for acquiring the land were well advanced. The actual construction work will begin in the early part of next year. A main and subsidiary runway will be laid down, and adequate terminal buildings will also be erected. Navigation and landing aids, which include I.L.S. on the main runway, are to be installed.

Eland Convair Approved

It has been announced by D. Napier and Son, Limited, that the United States Civil Aeronautics Administration has now fully certified for all types of commercial operation its turboprop version of the American Convair 340 airliner. This is the first occasion that a twin-engined airframe of American design with any propeller-turbine engine has received certification. It is also the first time in the history of aviation that an aero-engine firm has equipped an aircraft with its power plants and obtained for it an internationally accepted certificate of airworthiness for civil operation. Moreover, this success has been achieved in the United States by a British company. Napier purchased this Convair from the United States and, as a private venture, removed the piston engines and installed its Eland 3,500 e.h.p. propeller turbines. The aircraft flew to California from Luton in November last year to undertake the long series of rigorous tests laid down by the American authorities. In the course of this programme many of the test rules, as applicable to turbine-engined aircraft, were being applied for the first time by the U.S. authorities.

NEW MEMBER OF B.T.C.



John Ratter

Mr. J. RATTER, C.B.E.

.....

As already recorded in MODERN TRANSPORT, the Minister of Transport and Civil Aviation has announced the appointment of Mr. John Ratter as a full time member of the British Transport Commission in succession to Sir J. Landale Train who retires on September 30. Educated at St. Peter's School, York, and Durham University, Mr. Ratter began his railway career in 1929, as a pupil of the then engineer of the North Eastern Area, London and North Eastern Railway. After holding several appointments with that company he joined the London Passenger Transport Board in 1936 as an assistant in the permanent way department. In 1938 he returned to the L.N.E.R. as assistant district engineer, Sheffield. Mr. Ratter served throughout the war with the Royal Engineers in France, Africa and Italy, and also at the War Office. He became Deputy Director of Transportation, C.M.F., with the rank of colonel and responsibility for railway reconstruction in the Italian campaign. He was mentioned in dispatches in 1942, awarded the O.B.E. and Legion of Merit (U.S.A.) in 1944 and the C.B.E. in 1945. On demobilisation he rejoined the L.N.E.R. and was appointed district engineer, Guide Bridge, becoming in 1946 permanent way assistant to the engineer, Kings Cross. In 1947 he joined the L.P.T.B. as civil engineer (maintenance), with responsibility for the maintenance of all railway and tramway permanent way and all rail and road service properties of the Board. This position he retained from January 1, 1948, under the London Transport Executive, until his appointment in July, 1951, to the Railway Executive as chief officer, engineering (works). In October, 1953, Mr. Ratter became chief officer (civil engineering), British Transport Commission, and two years later became technical adviser to the Commission. He is president of the Permanent Way Institution, an office which he relinquishes next January. His contributions to the proceedings of technical societies include his paper read in 1948 to the Institution of Civil Engineers, "Recovery, Repair and Distribution of Permanent Way Material," which was awarded the Crampton Prize.

JAMAICAN ACCIDENT

Devastating Derailment

REPORT OF INVESTIGATION

FEW railway accidents have been more devastating in their consequences than that which took place near Kendal on the Jamaican Government Railways on September 1, 1957, when a crowded special excursion (it possibly had 1,800 passengers) was derailed at high speed; the coaches broke up to such an extent that at least 188 (and possibly 192) passengers were killed and 1,035 persons were treated in hospital. A Commission of Inquiry was appointed in Jamaica and in view of the extraordinary nature of the accident it was decided that it should be assisted by an assessor, for which purpose the services of Brigadier C. A. Langley, now Chief Inspecting Officer of Railways, were made available by the British Minister of Transport. Reports by the Commission and by Brigadier Langley have now appeared.

Particular Interest

They must command particular interest, transcending that of most railway accident reports, in view of the allegations made against the management of the railway and of the clever detective work made apparent in the assessor's account as a result of which the real cause of the accident was tracked down to the striking of a wrongly mounted air brake angle cock by a coupler so that no brake power was available behind the third coach of a 12-car train. The speed as a result rose to 55 m.p.h. on a curving descent at 1 in 30, resulting in derailment of the first nine coaches. But although this accident was due to the accidental closure of an incorrectly placed angle cock, the inefficiency and lack of discipline disclosed by this inquiry and the falsification of evidence by some of the witnesses revealed a state of malaise which seriously affected the safety of railway operation.

The failure of the acting traffic manager to make adequate arrangements for the excursion train and the lack of control by the stationmaster led to the train departing from Kingston dangerously overcrowded. The stationmaster at Montego Bay failed to supervise the brake test and accepted a certificate signed by the wrong driver. Finally, on the last stage of the journey the guard and one brakesman were travelling on the engine and one was between the third and fourth coaches, thus leaving the last brakesman to look after two-thirds of the train; in such circumstances the proper handling of the retaining valves of a packed train on the long falling gradients was quite impossible. Nor was the guard in a position to stop the train in emergency.

Overwhelmed by Circumstances

After the accident no steps were taken by the general manager, or by the assistant to the general manager, or by the traffic manager to institute any inquiry into the cause, and these officers stated that they did not consider this necessary because the Commission of Inquiry had been appointed. It would seem that the management was overwhelmed by the magnitude of the disaster and concentrated its energies on relief measures; the assistant general manager remained at Kingston and did nothing to initiate any inquiry.

The failure of some of the senior railway officers to realise their responsibilities was demonstrated when the acting general manager, the acting assistant to the general manager, and the acting traffic manager were implicated in the presentation to the Commission of a false brake certificate which was obtained by the air brake inspector who also produced a faked book of records.

Recommendations

It was recommended that the organisation of the managerial and traffic departments should be reviewed with the object of strengthening them both at the higher as well as at the lower levels; the supervisory staff of the engineer (mechanical) should be strengthened by the appointment of an outdoor supervisor responsible for the running and day-to-day maintenance of both locomotives and rolling stock, and a workshop supervisor experienced in the repair and maintenance of diesel engines; the size of passenger trains should be reduced to eight of the old coaches; if longer trains are required they should be made up with the new all-steel coaches placed next to the engine; the old passenger coaches should be replaced by modern stock as quickly as possible within the limits of the available resources; the modern type of conductor's valve should be fitted in all coaches; and the retaining valve should be replaced by an additional straight air brake on the engines and coaches.

It was further recommended that the rule book should be reprinted without delay and brought up to date, and the brake instruction booklet should be clarified; stationmasters should sign brake certificates and the examination of station records should be more frequent and more thorough; unauthorised persons should not be allowed to travel in the cab or on the platforms of engines; the arrangements for dealing with excursion trains need overhauling and the number of standing passengers should be limited. The reports will be available in London shortly from The Crown Agent, 4 Millbank, Westminster, S.W.1.

SALES CONFERENCE

Organised by British Timken

MONDAY of this week saw the opening by Sir John Pascoe, chairman and managing director of British Timken, Limited, of a most important sales conference of over 100 sales and technical representatives of his company and its overseas subsidiaries and distributors. They met at Coventry to examine the foreign markets that exist for British-made tapered roller bearings, and to ascertain how British Timken could contribute still more to this vitally important part of the British export drive. Tapered roller bearings were first made by British Timken in this country in 1909, mainly for the motor industry and they are now, of course, an essential part of almost every manufacturing industry.

The party has been paying visits during the conference to the British Timken factories at Davenport and Duston and to the subsidiary—Fischer Bearings Co., Limited, at Wolverhampton, as well as the Birmingham Railway Carriage and Wagon Co., Limited, and the Standard Motor Co., Limited. The ending of the conference coincides with the first day of the British Timken Show (August 29-30) which takes place on the 70-acre sports ground at Duston, Northampton. The representatives will then fly to Brussels in two chartered Vickers Viscount aircraft for a two-day visit to the Brussels Exhibition, where the British Timken stand is a feature of the British Industries Pavilion.



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ALPINE TRANSPORT

(Continued from page 6)

never reopened; it has since been dismantled. This experience seems to have deterred the Swiss from building anything further of the same kind until a good many years later.

The greatest impetus to the building of *Luftseilbahn* or téléphérique lines was probably given by the Italians, as a result of their experience with suspension transport while at war with the Austrians in the Dolomite region during the 1914-18 war. The Austrians had already opened a line of this type from Bozen (now Bolzano) up to Kohlern (now Colle) in 1913, with an ascent of 2,830 ft., but it was the war developments that spurred on téléphérique building in Italy, Austria and Germany between the wars, as also in France. A notable Austrian line, opened in 1926, is that from Ehrwald to the summit of the Zugspitze, a single-section ascent of no less than 5,187 ft. in a length of 3,695 yd.

French Enterprise

The French have been responsible for some of the most remarkable téléphérique projects in Europe, the most outstanding of which is the three-stage line from Chamonix to the summit of the Aiguille du Midi, in the Mont Blanc massif, 12,600 ft. above the sea, though the Italians come but little short of this with their suspension lines up the south side of the same mountain chain. Indeed, the Italians were only deterred from an attempt to reach the 14,840-ft. summit of the Matterhorn with a branch téléphérique from their three-section Corvinia—Theodul Pass line by the fact that, owing to the mountain's overhang, their line would have had to finish on Swiss territory, for which the Swiss Government was not prepared to grant a concession. Since the 1939-45 war, however, the maximum activity in building suspension lines has undoubtedly been in Switzerland, which now probably has a greater concentration of such transport relatively to the area in which it is found than any other country in Europe.

Opportunities Here?

With such experience on which to draw, it seems remarkable that, apart from two very short lines put up for entertainment in the Dudley Zoo and from Bray up to Bray Head in Eire, nothing of the kind has ever been attempted in Great Britain or Ireland. We have neither high-lying villages requiring access, nor could any such lines here depend on ski-ing for a large proportion of their revenue, but apart from the rack-and-pinion railway from Llanberis to the summit of Snowdon, we also have no mountain summits or fine viewpoints accessible by other means than climbing them on foot.

As was pointed out recently in a letter to the *Daily Telegraph*, a chair-lift or suspension line with cabins up a mountain such as Ben Lomond, relatively close to a great centre of population like Glasgow, would be likely to find very considerable patronage in fine weather; equally a line from Wythburn, on the main Keswick—Ambleside road, to the summit of Helvellyn would be readily accessible from all the neighbouring holiday centres and a perfectly simple engineering proposition. In any event, European experience shows that transport by suspension has before it a very definite future, and is likely to extend still further.

B.R. RAILBUSES

(Continued from page 7)

shock and noise when passing over rail joints. To ensure a clean air supply to the engine the air intake is taken from the roof by ducting. The driving controls at each end of the railbus are particularly simple in action, and the entire driving technique can be mastered within about 10 minutes. The braking system is of the Dunlop Monitor type, as described last week; it successfully eliminates wheel locking under wet or dry line conditions while maintaining optimum braking. The braking effort is achieved by a monitor brake shoe which initiates and controls the main braking effort through disc-type brakes. As the wheel rims are kept clean by the rubbing of the monitor shoe on the rim good contact is made between wheel and rail for track-circuiting. The bus-type mechanical handbrake operates on all four wheels and is sufficiently powerful, being assisted by the automatic servo action of the Monitor brake system, to allow the vehicle to continue to operate in the event of an air brake failure.

Construction

The general construction is based on an integral design having an all-steel underframing, whilst the body is constructed entirely of aluminium alloy extrusions and panelling, and is completely integrated with the underframe, thus providing maximum stiffness. Sound and thermal insulation is provided by filling the space between the interior and exterior panels throughout with a lightweight plastics insulating material. Acoustic panels, 2 in. in thickness, are fitted below the floor, and the floor is covered throughout with sound deadening material below the wearing surface. All the windows have safety glass, glazed by the Eastern Coach Works Fastflex system. Six hopper-type ventilating windows of E.C.W. design are fitted to each side of the body.

The interior is finished in cream leather-cloth with green moquette on the seats; the ceiling is enamelled in white. The interiors of the driver's compartments are finished with dark green leather-cloth. Parcel racks are provided on each side of the passenger compartments. The racks, which are of plastic netting and alloy tube, also carry a stainless steel handrail and are hung on polished aluminium alloy brackets. There are power-operated sliding doors under the control of the driver, one on each side of the body. A safety interlock ensures that the vehicle cannot be driven away until the doors are closed. Heating for the interior is provided by a Smiths oil-burning heater, the warm air being ducted to each passenger compartment and to the driver's compartments. The exterior is finished in B.R. standard green, with lighter green banding, and is fitted with a polished aluminium moulding below the windows. No buffers are fitted, but two tubular units, at standard buffer height and width, directly connected with diagonal struts to the main longitudinal frame members, support a bumper bar.

The Municipal Passenger Transport Association announces that all tickets and relevant papers in connection with the annual conference to be held in Blackpool during the week commencing September 8 have now been issued.

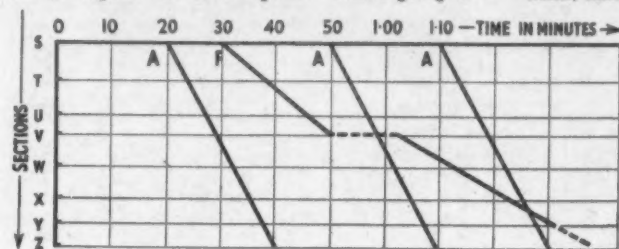
RAILWAY TIMETABLES

Compilation on a Digital Computer

By D. A. ALDRIDGE, British Railways, Eastern Region
and J. F. DAVISON, Ferranti, Limited

INFORMATION tabulated in complex form in a railway timetable can, of course, be presented much more conveniently graphically. Graphs usually show geographical locations from top to bottom, and time from left to right. For timing purposes the line is split into convenient sections, and the time on one graph covers either six or 12 hours. The locations are placed on the graph (in scale) geographically correct, so that if a train path is shown as a completely straight line, the train is in fact running at a constant speed. The accompanying illustration of a graph is simple, but indicates the principles.

This shows three express passenger trains being given an uninterrupted run from S to Z, with a freight train (F) being held in a loop at V to wait until the second express has passed, and then being turned into a parallel independent line at X so as not to impede the third express. Trains going in



Simplified graphical timetable

the opposite direction from Z to S are drawn on the same graph because, of course, their paths at junctions may be affected by the trains on the opposite line.

Complications

A graph can obviously become a complicated affair, with peak operation in suburban areas, winter and summer service revisions, changing freight traffic flows and special passenger service requirements; and the question naturally follows whether the work can be presented satisfactorily to a computer to obtain the best of several possible solutions to the problems. The suburban area is in fact a problem on its own, particularly at the time of the peak services. Whether this would remain a separate problem when using a computer remains to be seen. If it does not do so, it is easy to grasp an idea of the potential time saving. Bi-annual revision is made to timetables to allow for the considerable change in traffic requirements from winter to summer, and to cater for the ever-changing flows of freight traffic. A large number of special passenger trains is provided both to sea-side and inland resorts on most days during the summer period. Peak requirements for these additional services are at weekends to provide for holiday or excursion travel. All these additional trains must be timed through the existing timetables.

These trains also bring timing problems by way of empty coaching stock being brought from sidings, not always particularly close to the departure station. There is a considerable amount of work involved in timing, and providing crews and stock for these extra trains, but apart from this type of train there are the special freight trains. Here again these may involve altered timings at the weekend, or during a period when fruit, seed potatoes or sugar beet, for example, have to be moved throughout the country.

Inter-regional Problems

Timing and crew rostering does not necessarily end in one office. It is necessary frequently to get inter-regional agreement for junction timings, or perhaps agreement upon allocations of depots for providing engines or men. When timing trains consideration must also be given to the most economical way of rostering locomotives and train crews. The number of variations possible with a large number of trains can obviously take much time before the final agreement is reached. Once again, if a computer could tackle the whole of this problem, a saving of time would be made, possibly a matter of weeks. This raises the question still to be answered as to how large a section of a railway should be timed on the same machine.

Certain basic principles are involved in making a timetable, some governed by law (block working, though not necessarily for freight if on an independent goods line), some by physical restraints (two trains cannot pass over a conflicting junction at the same time), some by necessity to give some latitude so that trains may be superimposed on an existing timetable from time to time (recovery margins, spare paths, refuge sidings) and the need to give precedence to certain classes of train.

Using the Computer

An assessment of the possibilities of doing the work of a train timing office on a digital computer is now being made at the London computer centre of Ferranti, Limited. The computer being used is the Pegasus. Although Pegasus may turn out to be not large enough for the job without additional storage, such as magnetic tape, this does not hinder experiments being conducted as to the feasibility of doing the job on a computer. In fact it is not until one has made several attempts on the problem on a small scale that the computer requirements in terms of storage, speed and input-output media can be determined with any accuracy.

If one tries to break down the operation of fitting a new train into an existing graph, difficulties soon appear. Local circumstances, which differ so much, will be a main factor, and the foundation of

the operation will be the experience of the timing clerk, who will be intimately acquainted with the service and the section of line affected. He will be able to accept or reject with very little thought various suggested entry times of trains into his particular section of line. In other cases he will be able to form an idea of the effect upon other trains in other areas that a retiming will have.

Basic Methods

This kind of circumstance must be borne in mind when programming the problem for a computer, so that times which are acceptable to the line being timed, may also be acceptable to another area to be timed later. Consideration of the basic principles of the problem led to three possible ways in which it might be tackled in a systematic way.

(1) *One train at a time*—One could scan over all trains, fixing the paths for each in terms of those already planned until an inconsistency emerged. Then one would correct for this and go back to the beginning. Eventually one might emerge with a timetable, but it could hardly be guaranteed, and the result would obviously be far too dependent on the order in which the trains were dealt with. There is no logical order, as the real situation is continuous, with trains in both directions passing and being overtaken and any train might affect any other. Thus this approach is not promising and has not been attempted.

(2) *One time at a time*—With this approach one keeps a record of the line for which the timetable is being made, indicating exactly where each train is at a given time. The essential difference between this and other methods is that in this case trains are timed irrespective of their priority and classification. We might start (not very realistically) with a stretch of line with no trains on it, and, taking a simple case of working in one direction only with no junctions and loops, feed trains in one at a time at one end, and trace them to the other.

The line would be divided into timing sections, and the basic principle is that only one train can be in a section at any time. If a train arrives at the beginning of a section and another train is still somewhere in this section, it must wait until the section is clear before entering.

In general trains travel at varying speeds, according to their class, ranging from express passenger down to local goods. Each class is allowed a certain time for a given section, thus we have a table for the line which might appear thus.

ALLOWED TIME IN MINUTES									
Class of train	A	B	C	D	E	F	H	J	K
Bolton-Garby	4	5	5	5	5	6	8	8	10
Garby-Louthorpe	8	10	9	9	11	13	14	15	
Louthorpe-Smaleton	3	4	4	5	6	7	7	9	
Smaleton-Doring	4	6	6	6	7	8	9	11	

Given this information and the time at which the trains are offered at the first station, they can be traced through the system by adjusting the record minute by minute. When a train arrives at the beginning of any section, there must be a check as to whether the section is occupied; if so,



The Ferranti Pegasus electronic computer at Portland Place, on which the planning for computation of timetables is being carried out

it must wait and try again one minute later; if not it can be placed in the section together with the time at which it is due to clear section, as worked out from the table. Eventually after scanning the system all the trains will have emerged and the line will be empty again.

Clearly this is far too simplified a railway system to be of any real interest, but a programme was written for Pegasus to deal with it, mainly to establish the method of holding the information and as a programming exercise. From this point more and more real timetabling complications have been introduced and the programme, before being abandoned for the method described later, was a very complicated one with over 2,000 computer instructions.

Difficulties

The main difficulties are loops and junctions. The former involve trying to look ahead in time to decide whether a certain train ought to be put into a loop line for a following train to pass. In the simplest case this is fairly easy. It is usually considered essential for expresses not to be delayed by even one minute by a slower train so provided one knows which the following train is, one can compute it and the slower train forward to the next loop ahead; if the express catches the slower train by this point the latter must be kept in the loop it is now at,

Continued on page 12



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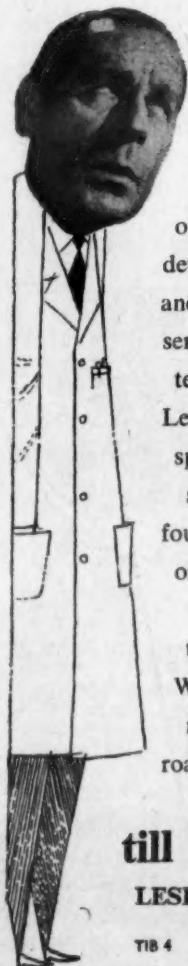
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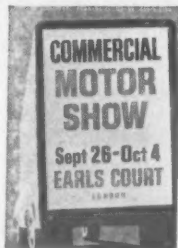
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SCOTTISH WEEK

Role of Scottish Omnibuses

AS recorded in our issue of August 23, Scottish Omnibuses, Limited, has announced the placing of orders for 288 buses and coaches for delivery in 1959 at a cost of £1,370,000. These

of labour in the country with 20,000 employees, the group met an annual wage bill of £9,691,000. Fuel—bought in Scotland—cost £3,177,000, tyres £465,000 and uniforms £109,000. These were only a few of the many items which it bought in Scotland but in themselves they gave a fair indication of the far-reaching effects of its spending power in other industries.

In addition to the vehicle orders a rebuilding programme involving extensions to garages at Motherwell and Stepps and a new garage at Baillieston would cost the group a further £135,000 while a new bus station at present in course of construction at Dundee would cost £125,000. All this work was being done by Scottish contractors.

To mark Scottish Week there would be an exhibition at the main garage in New Street, Edinburgh, which would show the development of transport from the early days to the present. This would comprise a number of vehicles from the famous collection of Mr. J. C. Sword. Contrasted with them would be a number of new coaches. That would be the focal point but, in addition, it was proposed to carry the slogan of Scottish Week on all

the buses and promote special Scottish Week displays in inquiry and booking offices throughout the country. The group was also operating a number of special tours to factories and farms which would themselves be on display during Scottish Week.

DETAILS OF NEW VEHICLES ORDERED FOR 1959

Company	Number	Chassis	Body	Builder
s-d d-d total				
Scottish Omnibuses, Limited	45	A.E.C. Reliance	41-seat dual-purpose 38-seat luxury coach 60-seat	Park Royal (25)
	27	Bristol Lodekka 27 ft.		Alexander (20) Eastern Coach Works
W. Alexander and Sons, Limited	45 27 72	Leyland Tiger Cub	41-seat dual-purpose 41-seat dual-purpose 67-seat	Alexander
	30	A.E.C. Reliance		Alexander
	20	Leyland Titan PD2 30 ft.		Alexander
	30	Bristol Lodekka 27 ft.	60 seat	Eastern Coach Works
Western S.M.T. Co., Limited	50 50 100	Guy L.U.F.	41 seat dual-purpose 67-seat with door	Alexander
	49	Leyland Titan PD2 30 ft.	67-seat with door 60-seat with door	Northern Counties (20) Alexander (29) Eastern Coach Works
	27	Bristol Lodekka 27 ft.		
Central S.M.T. Co., Limited	9 76 85	Leyland Titan PD2 27 ft.	59-seat 59-seat	Alexander (15) Northern Counties (10)
Highland Omnibuses, Limited	25 25 25	Not yet decided		
	6 6 6			
	104 184 288			

orders are set out in an accompanying table. Mr. James Ames, chairman and managing director, made the announcement in connection with the holding of Scottish Week from September 1 to 6. He pointed out that as one of the largest employers

Railway Timetable Compilation

(Continued from page 11)

or not allowed to enter the system at all at this time, otherwise it can proceed on the main line. In fact the situation can be far more complicated than this. Either train can leave the line at a junction at any point; other trains, faster or slower, may enter the line by a junction; the slow train may be liable to be held up by an even slower train ahead, so invalidating the times computed to the next loop, and so on.

Such situations as this showed up the limitations of a programme based on a time unit examination of the line. It is not necessarily possible to use the same blocks of programme to time a train in its own right and to estimate its path forward. The results however must be exactly the same. Thought was given therefore to writing a programme which gave scope for changing one's mind (an essential part of timing special trains of high priority) and which made decisions quickly when a simple path forward existed.

(3) *One timing section at a time*—A programme is now being written to cover this method of working. It is anticipated that magnetic tape equipment will have to be used in conjunction with Pegasus for two reasons. Firstly, the amount of data to be used. Excluding suburban services, there are in the region of 600 trains a day which run over either all or part of the line between Kings Cross and Doncaster. Before attempting to time any one of these trains, basic information must be readily available regarding its classification, number (for identification purposes), the time it is required to start its journey, where from and where to, where it must stop, and whether it must run main line or over an independent line at any particular place.

Storing Information

One must also store timing section information. Here again another long list could be written. To name but a few—running times over the section, intermediate signals, loops, independent lines and stations. The second reason for the necessity of magnetic tape is the recording of results. The whole timetable must be recorded in some form so that it is readily available for use when timing special trains on top of it. Also it must be available for computing the rostering of crews, engines and stock. Storing such information on the computer drum would limit the size of the line being timed, and would also limit the use of the computer for problems not connected with timetabling, thus making its use uneconomical.

The programme written so far provides for the timing of one class of train (naturally the highest first) through one section, taking into consideration the running time, and any stops, together with stopping and starting allowances. The computed times are compared with any other train times previously recorded in that section. Its own times will be recorded in two forms. One will be attached to blocks set aside for the complete path of that particular train and is used later for providing output. The other will be stored in blocks attached to the section concerned and in this case the section occupation will include the time which is required to elapse before another train can enter. The programme provides for a temporary note to be made of the time a train passes out of one section into another, so that when all trains of one class have been timed through one section, the process is repeated. At the end of the stretch of line being timed, all trains of the same class are timed in the opposite direction. It should be pointed out that note is taken of any train which must cross the opposite line to leave the system.

Quick Work

Trains can be timed quite quickly in this manner, until a clash is found in a particular section. So far the programme only provides for altering the path of a train which is actually in the process of being timed, but consequential alterations to trains already in the system will be dealt with later. The types of alteration covered now are signal stops, earlier or later entry into the system, or turning into loops or independent lines. The order in which time alterations are considered does not at the moment matter, and will be decided when a final programme is produced. It should be explained that no attempt has yet been made to write a programme which can actually be used by a timetabling office, but merely to demonstrate the feasibility of such a programme. Thus where an extra-

potation from existing experience has been justifiable, it has been made.

The following is an example of output, which is in effect an attempt to produce as nearly as possible the way a train path is shown in a working timetable at the present time. Shown first is the title of the train, giving its number, classification, the time it passes into the line being timed, and where it is from and to. The latter is given as a number, as are the places where timings are given. Obviously the computer can store names, but it is not necessary to do so at present. Passing times are represented by a stroke between the hours and minutes. Where a train stops, both times are shown. The last time shown, with no section number, is the time the train passes out of the system.

Further Examples

The following timing is of a Class D train stopped at Section 6. The asterisks denote that it has been looped for a higher priority train to pass, and this train's timing is also given.

690D	0.01	15-1
15 0/01		
13 0/14		
8 0/42		
6 0*53		
1*13		
5 1/10		
1 1/42		
1/50		
25A	0.28	15-1
15 0/28		
13 0/38		
8 0/57		
5 1/21		
1 1/28		
1/34		

The next example is of a similar operation, except that the lower priority train can still run forward on an independent line. This line is denoted by SL (slow line) returning to FL (fast line) when the higher priority train has passed. There are several variations to the type of line. The actual turning in and out is shown by the character "X" in the timing.

55C	3.29	15-1
15 3/29		
14 3/x39		
13 3/46		
12 FL		
10 4/x08		
8 4/17		
5 4/32		
1 4/52		
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How far the complex work of a timing office and the skill and knowledge of the clerks can be reflected in suitable codes so as to enable the computer to set out times must for the moment be a matter for the future, but the possibilities of high-speed faultless timings are obviously there.



Bradford Corporation was the first to obtain a no-waiting Order in respect of bus and trolleybus stops in the city centre. This view shows a bus stop with the no-waiting sign on the post

MODERN AIRWAYS and COMMERCIAL AVIATION SECTION

B.E.A. HAS A GOOD YEAR

Report for 1957-58

FURTHER OUTLOOK LESS PROMISING

PUBLICATION of the annual report of British European Airways for the year ended March 31, 1958 (H.M. Stationery Office, price 7s. 6d.) shows that the corporation made a record profit at a time when, like other airlines throughout the world, it experienced serious financial problems. Profit for the year, after deducting interest and before providing for taxation, was £1,054,807. This was £849,082 more than for the year before and £429,623 better than B.E.A.'s previous highest profit.

In the report and accounts, Lord Douglas of Kirtleside, the chairman, says that although traffic went up by 14 per cent during the year, there was a marked fall in the growth of winter traffic partly because of a world trade recession and also, on domestic routes, because of the effects of a high bank rate. This accentuated the summer-to-winter traffic variation. One of the most significant aspects of the results was a 15 per cent capacity increase with only five per cent more staff. This means that productivity increased by 10 per cent during the year.

Revenue

Use of the Viscount, which was pioneered by B.E.A. and was now established throughout the world as the outstanding short-haul aeroplane, was also an important factor in the corporation's financial success. "The costs of being an innovat-

FINANCIAL

	1957-58	1956-57	Percentage variation
Traffic revenue	27,352,057	23,080,678	+18.5
Total revenue	28,340,725	23,947,774	+18.3
Expenditure on operating account	26,465,070	23,023,008	+15.0
Total expenditure	27,285,918	23,742,049	+14.9
Interest on capital	1,858,887	807,285	+130.3
Profit for the year	1,054,807	235,725	+412.7

*Comparative figures for 1956-57 have been adjusted to reflect changes in the method of presenting 1957-58 results.

ing airline are considerable, but when the aircraft is a success the rewards are commensurate." Total revenue went up by 18 per cent to £28,340,725 and expenditure on operating account rose by 15 per cent to £26,465,070—a reflection of higher aircraft standing charges and rising prices. Steady improvement in efficiency, however, enabled the operating cost per capacity ton mile to be reduced slightly to 39.6 pence.

Highest Load Factor

B.E.A. carried 2,765,591 passengers, 24,555 tons of freight and 7,465 tons of mail during the year. Its passenger load factor on international routes (67.9 per cent) was the highest of any major intra-

PERCENTAGE OF EXPENDITURE

TOTAL EXPENDITURE during the year comprised:	1957-58	Percentage of total	1956-57	Percentage of total
Pay, allowances and other staff costs	10,437,155	38.3	9,317,245	39.3
Aircraft fuel and oil	3,241,345	11.9	2,720,885	11.5
Aircraft maintenance and overhaul (including stores costs but excluding labour and accommodation)	2,315,304	8.5	2,294,329	9.7
Amortisation of aircraft and spares	2,180,441	8.0	1,496,241	6.3
Commission on sale of tickets, etc.	1,991,329	7.0	1,589,734	6.6
Landing fees	964,256	3.5	738,505	3.1
Accommodation costs	930,199	3.4	829,481	3.5
Interest on capital	804,080	2.9	601,560	2.5
Pensions	793,838	2.9	580,112	2.4
Passenger meals and accommodation	743,396	2.7	701,872	2.9
Charter of aircraft and crews	711,350	2.6	655,852	2.8
Advertising and publicity	587,933	2.2	495,758	2.1
Depreciation of premises, operating and other ground equipment	517,631	1.9	478,449	2.0
Aircraft insurance and uninsured losses (excluding training)	349,520	1.3	322,973	1.4
Hire of aircraft and spares	6,481	—	220,673	0.9
All other expenditure less recoveries	801,749	2.9	718,080	3.0
	£27,285,918	100.0	£23,742,049	100.0

European operator, and its share of the normal scheduled traffic on the routes it serves rose from 57 to 58 per cent. Mainly because of large increases in independent operators' inclusive tour and car ferry services, its share of the total air traffic between Britain and the Continent fell from 44 to 42 per cent.

During 1957-58 the route network was considerably extended and plans were made for the introduction, in 1958, of two further routes of great interest. New services were opened to Ankara, Beirut, Belgrade, Dublin, Tel Aviv, Prague and Valencia. B.E.A. aircraft also operated into the Persian Gulf—to Kuwait and Bahrain—following an agreement with Cyprus Airways whereby B.E.A. Viscounts would be chartered by Cyprus Airways to replace Dakotas on the Middle East routes. Under this arrangement Cyprus Airways was relieved of the problem of financing a Viscount fleet of its own and of the difficulties of introducing and

CAPITAL

	At March 31, 1958	At March 31, 1957
Capital liabilities	32,042,857	23,050,000
Capital expenditure during the year	10,735,000	9,719,000
Book value of aircraft, aircraft spares and engine spares (excluding aircraft under construction) after provision for amortisation	18,656,649	12,947,000

operating a small number of complex modern aircraft. Cyprus Airways remains in control of its Middle East operations and the new arrangement will, it is believed, prove of mutual interest and advantage to both companies. It was also taken into account in the new agreement with B.O.A.C.

Routes to Eastern Europe

The two new routes for which plans were made during 1957-58 were those to Moscow and Warsaw. These routes involved lengthy negotiations both at Government and airline level. An air agreement between the United Kingdom Government and the Soviet Government was, however, concluded on December 19, 1957, and an inter-company agreement between B.E.A. and Aeroflot was signed on February 26, 1958. It is hoped that these agreements will lead to the introduction of a twice-weekly service by B.E.A. and Aeroflot between London and Moscow via Copenhagen. Similar agreements with the Polish Government and L.O.T., the Polish airline, led to a twice-weekly London—Warsaw service which started on April 2 this year. These new services, together with those already operated to Prague and Belgrade, will

provide for the first time a comprehensive system of routes between the United Kingdom and Eastern Europe. Such operations are not without their commercial and financial problems, and like all other routes, will have to be justified by their future results. B.E.A. attaches particular importance to these routes in the hope that, in the words of a great aviation pioneer, the air may be a link to unite the nations and bring them closer together.

The definition of the spheres of operation of the two British airways corporations has, in the past, given rise to some conflict of interest in the European area. B.O.A.C. naturally passes through European points on routes from the United Kingdom to Africa and the Far East and has also been anxious to provide certain through flights from North America to cities in Europe. Although exist-

TRAFFIC

	1957-58	1956-57	Percentage variation
Capacity ton-miles offered	160,281,788	139,078,802	+15.2
Load ton-miles sold	102,002,347	89,685,423	+13.8
Revenue load factor	63.7%	64.5%	-1.3
Load factor required to cover total expenditure	61.3%	63.9%	-4.1
Cost per C.T.M.	40.9d.	41.0d.	-0.2
Revenue per C.T.M.	42.4d.	41.3d.	+2.7
Revenue per L.T.M.	66.6d.	64.1d.	+3.9
Passengers carried	2,765,591	2,461,065	+12.4
Revenue passenger-miles	935,755,877	808,872,028	+15.7
Available seat miles	1,365,003,800	1,150,792,379	+18.6
Passenger load factor	68.5%	70.3%	-2.6
Mail carried—tons	7,465	7,541	-1.0
Mail ton-miles	3,590,500	3,622,641	-0.6
Freight carried—tons	24,555	22,524	+9.0
Freight ton-miles	9,925,764	9,227,790	+7.6

ing B.O.A.C. services through Europe have been operated in pool with B.E.A., they have, nevertheless, deprived B.E.A. of traffic within the area clearly recognised as its sphere of influence.

Agreement with B.O.A.C.

If B.O.A.C. were to have the freedom to increase its operation in Europe it seemed equitable that B.E.A. should be given the opportunity to obtain an equivalent amount of work within the sphere of B.O.A.C. The area that lent itself most readily to the expansion of B.E.A.'s activity was the eastern littoral of the Mediterranean: natural terminals for the extension of its routes to South-East Europe were provided by Beirut, Tel Aviv and Cairo. This was the basis of the agreement reached by the corporations in January, 1958. B.O.A.C. was now free, after consultation with B.E.A., to apply for Governmental permission to operate through any point in Europe it might desire; and B.E.A. might extend its services to Beirut, Tel Aviv and Cairo. The right of B.E.A. to operate services to the Persian Gulf on behalf of Cyprus Airways was also recognised in the agreement. In all cases, of course, the services operated by either Corporation are dependent upon rights being granted by the foreign Governments concerned.

Two major decisions need to be taken by European operators which will affect the development of European air transport, both in the long and short term—first, a decision regarding the number and type of classes of service to be provided, and second, the question of whether there should be differential fares at a higher level for services operated by jet aircraft. With effect from April 1, 1958, a new economy class low fare service was introduced across the Atlantic and there were now three main standards of service—first, tourist and economy—provided on that route. Although it was still early to judge, indications were that the economy fares had proved attractive despite the economic recession in North America, but there was some doubt about the value of continuing the former tourist services. Results so far gave support to B.E.A.'s view that there was no need in Europe to offer more than two classes of service, although present tourist standards should be simplified to allow for fare reductions.

Demand for Jet Aircraft

There was little doubt, the report said, that new jet aircraft because of their higher speed, would be more attractive to the travelling public than exist-

STAFF AND PRODUCTIVITY

	1957-58	1956-57	Percentage variation
Average number of employees	11,011	10,501	+4.9
C.T.M. per employee	74,557	73,244	+1.8
Revenue per employee	£2,574	£2,280	+12.9

ing aircraft, especially on the longer routes. Nevertheless, existing types, many of which would not be fully depreciated at the time when new jets begin operating, could still provide useful service to the public. It was considered that there should

OPERATIONS

	1957-58	1956-57	Percentage variation
* Regularity	97.4%	97.2%	+0.2
* Punctuality—(arrival)	80.1%	79.9%	+0.3
Line aircraft—average	113.0	101.0	+11.9
Revenue hours flown	190,472	181,692	+4.8
† Revenue utilisation—hours per annum	1,731	1,867	-7.3
† Cost per revenue flying hour	£143.3	£130.9	+9.5
† Revenue per revenue flying hour	£148.8	£132.1	+12.6
Aircraft-miles flown	33,205,246	30,155,498	+10.1
† Cost per revenue-mile flown	197.2d.	189.1d.	+4.3
† Revenue per revenue-mile flown	204.8d.	190.7d.	+7.5

* Passenger operations only.
† Excludes helicopter operations.

be a fare differential for jet aircraft, at least in their initial period, if existing aircraft types were to continue in service and airlines were to avoid an unnecessarily fast and expensive re-equipment programme, which must ultimately result in a higher general level of fares than need be the case.

"The order for the DH121, together with the Vanguard on order, sets the pattern for B.E.A.'s mainline operations for the next ten years or more. The corporation believes that there is a place in (Continued on page 16)

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LETTERS TO THE EDITOR

European Sleeping & Restaurant Cars

The Editor is always glad to receive letters from readers on subjects germane to the transport industry, but these should be written as concisely as possible. The opinions expressed therein must not, however, be regarded as having editorial endorsement. Where correspondents desire to use a nom-de-plume it is essential that the Editor should be informed of the name and full address of the writer as indication of good faith.

SIR,—May I correct a couple of minor inaccuracies in the excellent article on European sleeping and restaurant cars in your issue of August 23. It is not quite true that before the war international sleeping and dining car services were exclusively the province of the Wagons-Lits company, nor for that matter is it true that the D.S.G. cars offer the cheapest sleeping car services in Western Europe.

To take the first point, the international services between Sweden and Norway, and Sweden and Denmark are (and were) worked by sleeping cars of the Swedish State Railways, while before the war, the services between Berlin and Stockholm were provided (if I remember correctly) partly by Swedish State and partly by Mitropa cars. In addition, sleeping and dining cars of the Mitropa company did work round from Basel (Badische Bahnhof) to Basel (S.B.B.) so that they entered Switzerland and ran over the Swiss Federal Railways, even if only for a short distance, although they did not go on to Swiss internal destinations. On the other hand Mitropa Salonwagen—the Mitropa equivalent of Pullman cars, did work through to Lucerne and Chur at certain times of the year; I cannot remember for how many years this went on, but the summer of 1937 was one of them. They also formed the Rheingold train from the Hook of Holland.

With regard to prices, the Swedish cars at £1 11s. 3d. for a berth in a two-berth compartment (first-class) and 18s. 6d. for a berth in a three-berth (second-class) compartment, both inland and international and irrespective of distance are very cheap although the price of a single berth first class compartment at £6 10s. 3d. on internal routes is very steep. The prices on the Norwegian cars are even lower, but they, like the British Railways cars, do not work internationally.

Incidentally, nearly all the Eastern European railways now operate their own sleeping cars on international services which do not touch

"Western" countries. International services linking eastern and western countries continue to be worked by Wagons-Lits sleeping and restaurant cars of course, except for the Balt Orient Express sleepers from Sweden to Germany and Poland, which use Swedish and Polish cars.—Yours faithfully,

G. H. HAFTER.

47 Church Street,
Isleworth, Middlesex.

SIR,—In your interesting article in your issue of August 23 it was not made at all clear that Wagons-Lits meals are no more expensive than D.S.G. ones. They cost 6 DM and 4.75 DM in cars serving Germany. In other countries of Europe coffee and sandwiches are purveyed down the trains for those passengers who do not want a full meal in a W.-L. diner, and on many trains which carry no diner. In addition they staff and serve light meals at various prices from the buffet and snack bar cars of very varied nationality, some of them being T.E.E. trains, and others through electric railcars such as Amsterdam—Brussels, or (omitted from your list of cosmopolitan trains in Switzerland) the Austrian Federal Vienna-Zurich railcar.

Wagons-Lits supplements vary according to train and service. From Emmerich to Basel, the supplements for first-class single sleeper, first-class special, first-class double, and second-class tourist are DM 38, 27, 22, and 13 respectively.—Yours faithfully,

GEORGE BEHREND.

5 The White House,
Rozel,
Jersey.

Brussels Night Ferry

SIR,—I refer to my letter appearing in MODERN TRANSPORT of August 23 and B.R. comments you had kindly obtained. The date was July 11. If it was a duplicate service, the train was conveying also sleeping cars for Paris and the S.N.C.F. fourgons. As time at Dover is governed by shunting movements on to the ferry, one is prompted to inquire why the main train with the sleeping cars was the train that was delayed. The difficulties with relief crews are appreciated. The

late running of the up train could, however, be known before it left the Channel port.

As to operating supervision, I could only write as to what I saw. It is customary elsewhere for senior station officials to see the departure of "crack" services. It is assumed that this is of value and, by being on the spot, they can make decisions or take an initiative by virtue of experience and position when a junior official could not. The comments on my letter can only therefore be regarded as an interim reply, but I am glad that inquiries are still going on.—Yours faithfully,

PETER PROUD.

1 Verulam Buildings,
Gray's Inn, London, W.C.1.

L.T.E. Central Line Stock

SIR,—You report in your issue of August 23 that London Transport is considering designs for new Central Line motor cars, and rebuilding of trailers. Whilst the long outer suburban stretches of this line call for maximum seating accommodation, the inner area short-ride traffic is heavy, even in the slack hours. Some thought might therefore be given to the design of the standing space around the doors.

A few minutes' observation at any busy in-town station will show that every door is flanked by passengers leaning against the draught screens—two each side; the single end doors of the later stock will be similarly choked up by a body either side. It will be seen that as passengers board the cars they must thrust their way by these bodies as best they can. Loading is thus rendered more uncomfortable than it might be and station time is unnecessarily extended. Once ensconced in the draught screen position, the door-blocker will refuse to give way and the design of the car helps him to maintain a firm stand; it also encourages the main bulk of the standing passengers to form a solid mass between the doors, where they are neatly held in by the draught screens and no amount of pushing from those on the platform can get them into the gangways. It is not surprising therefore that despite the heartfelt cries of the staff enjoining "Pass down inside the car!" trains often leave without a single passenger standing in the gangways, but with their vestibules so packed that three or four attempts were made to close the doors.

A sensible solution was reached in the experimental redesign of car 012339 but we are told that this car made no appreciable difference to station times. In isolation, in a train of conventionally designed cars, this is hardly surprising, but a series of timings for a whole train of such cars and a train of ordinary stock would make an interesting

comparison. The loading platform of the 1956 stock (and, presumably, of the stock now on order for the Piccadilly Line) is no more advanced than that of the 1923 stock; the modern cars have more doors, but the standing space behind the doors is identically planned. A similar lack of development in this design feature is noticed on the London double-deck bus, whose platform design (and loading discipline!) is still basically that of the horse bus.—Yours faithfully,

A. A. JACKSON.

The Rectory,
Fairfield Grove,
London, S.E.7.

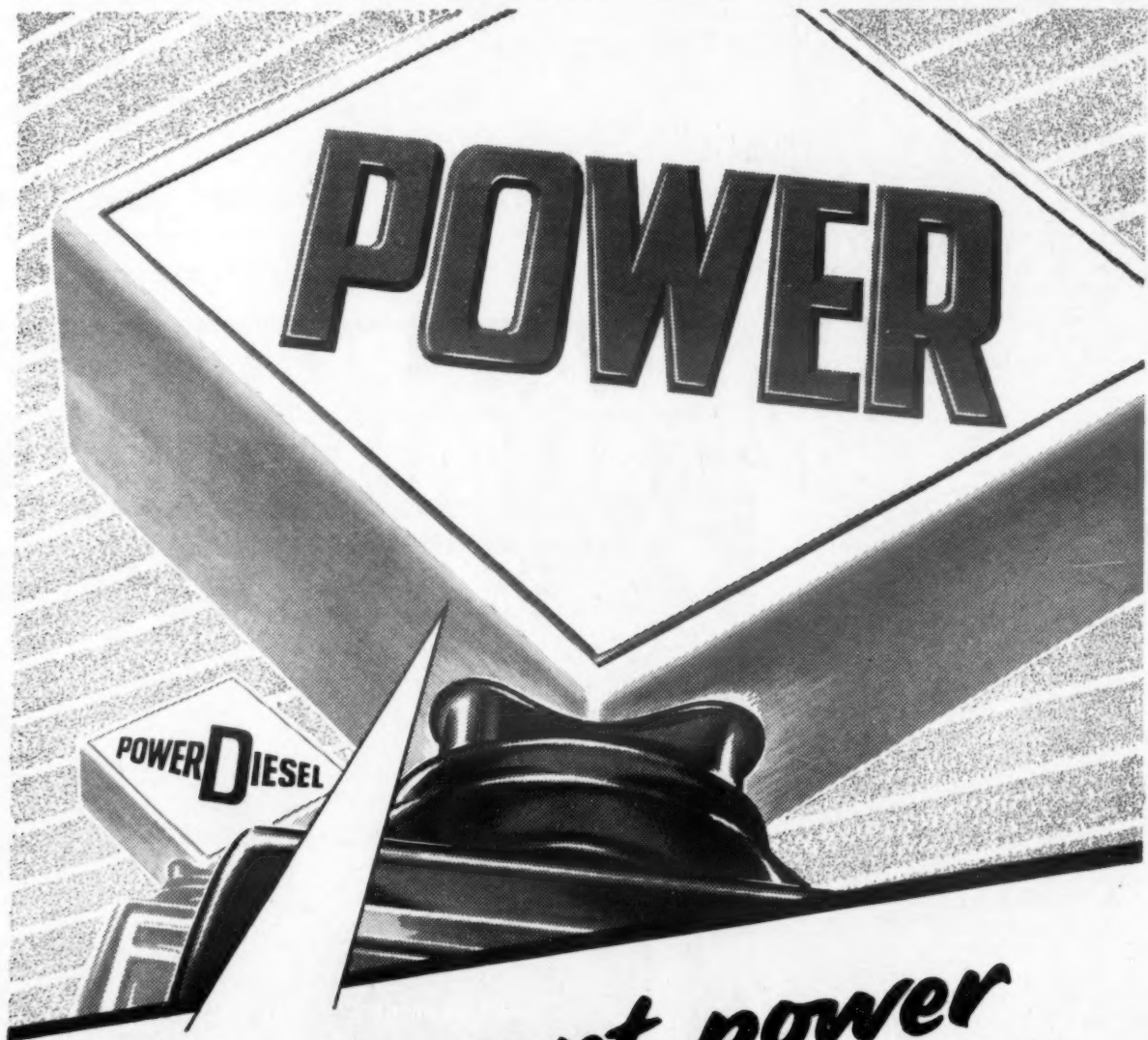
Cars and Public Transport

SIR,—Congratulations on your attack in MODERN TRANSPORT of August 16 on the barbarous three-way carriage way. As regards the City Police "discovery" of the origin of so many parked cars, surely it has been obvious for years that the Underground cannot provide even moderate comfort in the peak periods, hence the demand for staggering. The inconvenience caused by the recent bus strike was as nothing when compared with the congestion arising from the partial rail stoppage a year or so ago. Moreover the absence of buses showed that there is considerable slack hour demand for public transport.

Nevertheless, the drop in the population of the L.C.C. area by 25 per cent means that there is insufficient business to support passenger transport on the old scale. If there is to be a reduction, common sense suggests the buses. In the days of competition, robbing the railways of the cream of the traffic was legitimate, but under nationalisation it is proving suicidal. It is aggravated by keeping rail fares above bus fares, although theoretically both are supposed to adhere to the same scale.

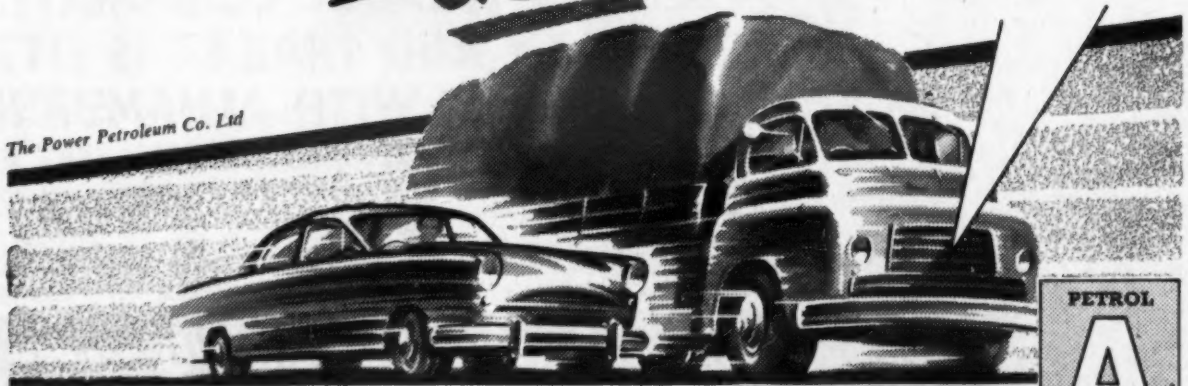
To reduce rail off-peak services must affect the rush hours. Anyone using one peak but not the other will tend to seek alternative transport, and recent events have demonstrated that this is likely to be private. At one time one man would say to another "What train will you catch?" to receive the reply "I do not know: there is sure to be one at London Bridge within a short time. Are you going to Kings Cross?" . . . "Oh, no: I keep away from there: there are never any trains there." The Southern can easily earn the same reputation. Remember the South Eastern of the music-hall comedian. What possible use is an hourly service from Lewisham to Woolwich?—Yours faithfully,

F. A. RULER.

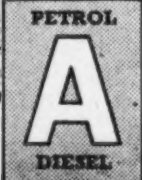
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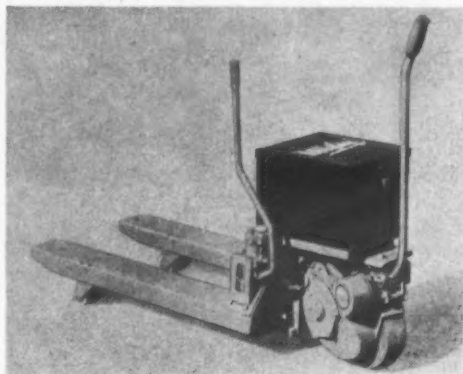
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Compact Features

OFFERED as an extremely compact and easily handled pedestrian battery-electric pallet truck, with manual- or power-operated hydraulic pump and ram, the Wrigley model E412P truck has its power unit completely enclosed, comprised in a small fabricated housing. This carries the motor with automatic brake on the armature, reduction gearing, controller, three-stud ball bearing wheel hub and taper roller bearing steering head, driving a detachable 10 in. by 3 in. bonded solid rubber-tyred wheel. This unit is offered in a variety of small chassis and body designs suitable



Wrigley E412P battery-electric pallet truck

for 10-cwt. loading for use in confined spaces, upper floors, gangways, lifts, etc. Length without the forks is only 21 in., and the claimed outside turning radius with 36-in. forks is 46 in. The complete power unit, with controls and drive, can be supplied separately if required in such form. Pallet forks are available in alternative lengths and widths to suit British Standard or special pallets. Nylon finger wheels are incorporated. The standard battery is an Exide 12-volt 87 amp-hr. unit in quickly detachable steel case. Unladen weight complete with battery is 450 lb.

Matling, Limited, has introduced the Matling-Wiltshire 800 range of three-wheeled industrial sweepers designed for sweeping paths of 24, 36 and 48 in. width. The machines are powered by a 5-h.p. or 8-h.p. petrol engine, which drives the rear wheels through a clutch and differential and the rotary brushes and vacuum unit through a V-belt.

Local agents have now been appointed by Ajax Marine Engines, Limited, manufacturer of marine engines based on Leyland and Albion diesels. Sales throughout the whole of Scotland will be handled by J. N. Macdonald and Company, The Marine House, 2196-2200 Paisley Road West, Glasgow, S.W.2, and in England south of a line from Burnham, Somerset, to Colchester, Essex, by Marine Power (Poole), Limited, Poole, Dorset. The remainder of the British Isles will continue to be covered from the head office of Ajax Marine Engines, Limited, Ridgeway Lane, Stockport, Cheshire.

Dowty Equipment, Limited, has concluded exclusive licensing arrangements with the Moog Valve Company, East Aurora, New York, whereby the well-known Moog servo valves extensively used in U.S.A. on aircraft, guided missiles and industrial equipment will be manufactured in this country. The licence agreement covers the United Kingdom, British Commonwealth (excluding Canada) and Europe (excluding Iron Curtain countries). Moog valves are closed-centre four-way spool valves in which the hydraulic output is proportional to the electric input. They have a high dynamic performance, compactness, low weight and high sensitivity.

SOCIAL AND PERSONAL

B.R. Chief Mechanical Engineer

FOLLOWING the appointment of Mr. R. C. Bond in the position of technical adviser to the British Transport Commission, wherein he will succeed Mr. John Ratter on October 1, the B.T.C. has decided to amalgamate the present mechanical and carriage and wagon engineering departments in the British Railways Central Staff under one officer. He will have the title of chief mechanical engineer and is to be Mr. J. F. Harrison, at present chief mechanical and electrical engineer, London Midland Region. Mr. Harrison will be succeeded in the latter capacity on October 1 by Mr. A. E. Robson, who is at present chief carriage and wagon engineering officer on the B.R. Central Staff. (A portrait and biography of Mr. Harrison appeared in our issue of August 9.)

Lord Cameron, D.S.C., Q.C., chairman of the court of inquiry which on Tuesday last week reported its findings in the pay dispute in the port labour industry (summarised in our last issue) has been actively engaged over a period of time in the examination of similar disputes in the transport industry. As chairman of the tribunal of inquiry into the railway wages dispute in 1955 he will be remembered for the dictum "The nation has pro-



Lord Cameron

vided by statute that there shall be a nationalised system of railway transport. Having willed the end, the nation must will the means," and he also came into the limelight over the inquiry into labour relations at Briggs Motor Bodies, Limited, following the "bell-ringing" episode. Sir John Cameron is a judge of the Court of Session in Scotland. He is also chairman of the Highlands and Islands Advisory Panel which, as reported on page 16, is currently considering proposals to reduce steamship services to the Western Isles.

Mr. T. G. Eato, hitherto assistant district commercial superintendent (general), Hull, has been appointed district commercial officer, Ipswich,



Mr. T. G. Eato

Eastern Region, B.R., under the traffic manager, Norwich, in succession to Mr. R. E. Lawler, who retired on August 27. Mr. Eato joined the L.N.E.R. in 1926 at Bulwell Forest. He was transferred in 1936 to the staff of the goods manager at Liverpool Street. From 1942 to 1946 he served with the Royal Engineers (Movement Control) in North Africa and Italy, and was demobilised with the rank of captain. In 1946 he took up the position of chief clerk in the district mineral agent's office, Kings Cross, and in the following year was appointed chief staff clerk to the London City manager and the district passenger manager, Liverpool Street. He became assistant (general) to the district goods superintendent (London City) in 1953 and was appointed

U.I.T.P. 1959 Congress

THE 33rd international congress of the International Union of Public Transport (U.I.T.P.) is to be held in Paris on May 24 to 30 next year. The following subjects will be discussed at the technical sessions:

- I. *Study Group Traffic Congestion:* "Conditions for a Successful Competition of Public Transport with Individual Transport":
 - (a) "Need of Public Transport Undertakings for Investments and the Possibilities of Providing for It," by Hr. O. Miescher, direktor der Basler Verkehrsbetriebe, Basle
 - (b) "Measures to be Considered by Public Transport Undertakings, and by Traffic and Town Planning Authorities," by Hr. F. Lehner, direktor und vorstandsmitglied, Ueberlandwerke und Strassenbahnen Hannover A.G., Hannover.
- II. *Study Group Light Railways:* "Under which Conditions Can it be Suggested to Local Railways that they Replace their Rail Transport System by Road Transport," by Mr. H. J. van Zuylen, directeur de Rotterdamse Tramweg Maatschappij, Rotterdam.
- III. *Study Group Metropolitan Railways:* "Signalling Systems for Metropolitan Railways," by Mr. J. O. Ancker, electrical engineer, A.B. Stockholms Spärvägar, Stockholm.
- IV. "Mechanisation and Use of Computers (Electronic Machines) in Public Transport Undertakings," by Hr. M. Mross, direktor und vorstandsmitglied, Hamburger Hochbahn A.G., Hamburg.
- V. "Trends in Motorbus Construction," by Messrs. E. R. L. Fitzpayne, general manager, Glasgow Corporation Transport, and W. M. Little, transport manager, Edinburgh Transport Department.
- VI. "Modernisation of Urban Transport Vehicles with a View to Saving Running Costs," by Messrs. A. Fogliano, direttore, and A. Paschetto, capo dei servizi tecnici, Azienda Tramvie Municipali, Turin.
- VII. "The Continuous Day with Staggering of Working Hours: its Advantages from the Point of View of the Operation of Urban Services," by Monsieur Gaynard, directeur général de la Compagnie des Omnibus et Tramways de Lyon.
- VIII. "New Material at the Disposal of Public Transport—its Utilisation for Construction and Maintenance," by Hr. K. Blenkle, abteilungs-direktor, Berliner Verkehrs-Betriebe, Berlin, and Monsieur F. Reynaert, directeur général de la Société des Transports Intercommunaux de Bruxelles.

Monsieur A. Gallois, hon. vice-president of the International Union of Public Transport, has resigned the office and Monsieur C. R. Pouillet, président de l'Union des Voies Ferrées, Paris, has been elected a member of the management committee to complete his term of office. Mr. Ben England, general manager of Nottingham City Transport, has also resigned his seat on the management committee.

A Lothians rail tour, organised by the Stephenson Locomotive Society (Scottish area) will take place on Saturday, September 6, and cover some 40 miles. The special train, hauled by a class C.16 ex N.B. 4-4-2T locomotive, will leave Edinburgh Waverley at 1.55 p.m. and use the now dieselised suburban inner circle to Niddrie, thence Smeaton Junction and Macmerry branch (closed 1925). Returning to Monktonhall Junction, freight lines will then be used to reach Portobello from where a trip will be made over the former N.B. North Leith branch (closed 1947). At Granton (closed 1925) the train will traverse the harbour line to join the ex C.R. route and run via Crew Junction to Edinburgh Princes Street, where the trip will end at 6.2 p.m.

Shortly to take over the duties of chairman of the East Midlands area Traffic Commissioners and Licensing Authority, Mr. C. R. Hodgson, O.B.E., M.Inst.T., has held the equivalent positions in the South Wales area since 1953. Mr. Hodgson was previously a solicitor. During the 1939-45 war he served abroad on the staff of the Judge Advocate-General. From 1947 he was legal adviser to the North Western Division of the National Coal Board.

Hebble Motor Services, Limited, announces that Mr. E. G. Dravers, traffic manager of East Midlands Motor Services, Limited, has been appointed to succeed Mr. F. K. Pointon as general manager of the Hebble company. As previously reported, Mr. Pointon will be succeeding Mr. S. J. B. Skyrme as general manager of East Midlands Motor Services, Limited.



Mr. C. R. Hodgson



Luncheon party at the Great Western Royal Hotel, Paddington, with Mr. K. W. C. Grand, general manager, Western Region, as host to present or retired staff holding civic office for the year 1958-59

Back row (left to right): Messrs. C. W. Powell, operating officer; E. Flaxman, commercial officer; W. R. Stevens, divisional traffic manager, Cardiff; M. G. R. Smith, chief civil engineer; I. M. Morris, Sheriff of Carmarthen; A. C. B. Pickford, assistant general manager (traffic); C. S. Thomas, Mayor of Welshpool; H. G. Bowles, assistant general manager (administration); C. J. Rider, public relations and publicity officer; and H. E. N. White, running and maintenance officer.

Front row (left to right): Messrs. H. L. Jones, Mayor of Brecon; E. J. Langdon, City High Sheriff of Gloucester; G. R. Perrow, Mayor of Totnes; A. J. Williams, Lord Mayor of Cardiff; K. W. C. Grand; F. S. Evans, Mayor of Neath; E. J. Broughton, Mayor of Stourbridge; A. L. Evans, Mayor of Fowey; and E. Edwards, Mayor of Rhondda

acting assistant district goods manager (London City) in 1954. In 1955 he transferred to the position of assistant district commercial superintendent (general), Hull.

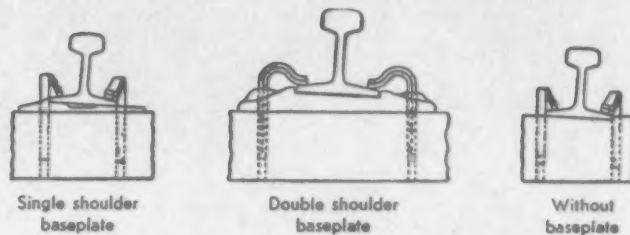
Mr. R. M. Maitland has been appointed assistant to district traffic superintendent (sales), York, North Eastern Region, B.R., and Mr. T. F. Cameron takes up the equivalent position at Hull.

We regret to record the death of Mr. H. M. Alderson Smith, who had been chairman of Lancashire United Transport, Limited, only since the death of Sir Joseph Nall in May this year. Mr. Alderson Smith had been solicitor to the company for many years before being elected to the board ten years ago.

We record with deep regret the death on August 22 at the age of 77 of Mr. Walter Leonard Larkin, for many years a popular figure in the transport industry and especially at conferences of busmen, in his capacity of chairman and director of the Equipment and Engineering Co., Limited. A joint founder of the business 50 years ago, he had occupied the chair for a number of years.

Mr. J. Taylor Thompson, M.C., M.I.C.E., J.P., chief civil engineer, London Midland Region, B.R., is retiring at the end of the year. He has held his present post since 1951 and was previously civil engineer of the North Eastern Region. He will be succeeded by Mr. A. N. Butland, O.B.E., B.A., B.Sc.(Eng.), M.I.C.E., at present assistant civil engineer.

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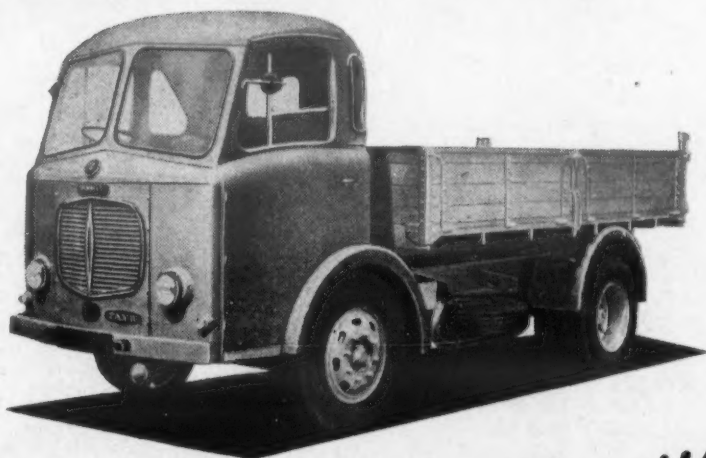
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IMPORTANT CONTRACTS SHIPPING and SHIPBUILDING

Free-Pistons for Finland

AWARD to National Free Piston Power, Limited, is announced of a £500,000 contract for free-piston and gas-turbine power station equipment for Finland. The contract is for 16 1,000-h.p. free-piston gasifiers from the National Gas and Oil Engine Co., Limited, and two gas turbo-alternator sets from the Brush Electrical Engineering Co., Limited. Participating firms are members of the Hawker Siddeley Group.

£5 Million Boiler Plant Order

A contract for boiler plant worth more than £5 million has been awarded by the State Electricity Commission of Victoria, Australia to the Australian subsidiary of Babcock and Wilcox, Limited. More than a fifth of the work will be carried out by the British company.

Douglas Tractors for 707

Qantas Empire Airways, Limited, Sydney, has bought Douglas DC7Q tugmaster tractors from Douglas Equipment, Limited, Cheltenham, for handling its Boeing 707 jet aircraft. The Douglas DC7Q is notable for employing a 230 b.h.p. diesel engine driving through hydraulic transmission, giving it a tractive effort of 32,000 lb.

Argentina Orders Fiat Coaches

The Argentine State Railways has accepted a proposal made by Fiat S.A. for the manufacture of 120 motor rail coaches in Cordoba and a further 90 in Turin, at a total cost of \$21,000,000. The delivery date for imported coaches is 14 months after the signing of the contract and local manufacture is to begin within 22 months. The factory to be established in Cordoba involves an investment of \$1,500,000.

Motorway Surfacing Contract

The contract for tarmacadam and the asphalt surfacing on Section D of the London-Yorkshire Motorway has been placed by John Laing and Son, Limited, with the Limmer and Trinidad Lake Asphalt Co., Limited. Section D runs from Kinsbury (near Northampton) to Dunchurch (south-west of Rugby), a distance of 15.9 miles. The contract covers the surfacing of the dual 36-ft. carriageways, the slip roads, cycle tracks, footpaths and entrances to side roads along the section.

British Radar for Germany

An initial order for 26 sets of its Type 14 marine radar has been placed with Kelvin and Hughes (Marine), Limited, by the German Ministry of Defence. The order was the result of a demonstration at Bonn, arranged by the company's German agent, Elna G. m. b. H., made during a 3,300-mile European tour by the Kelvin Hughes demonstration caravan. Substantial orders for the company's radar and echo fishing equipment are said to have resulted from the tour.

Compoflex Overseas Orders

The Compoflex Co., Limited, has received a repeat order for road tanker hoses from the Kuwait Oil Co., Limited, and a trial order for hoses has been placed by a large oil refinery in Sweden. Orders have also been received from users in the Netherlands for Compoflex high-pressure hydraulic hoses and 16 3-in. bore road tanker hoses. From New Zealand, orders for an unusually large number of petrol pump and tanker hoses have been received from various major oil companies as a result of the issue of import licences.

TENDERS INVITED

THE following items are extracted from the Board of Trade Special Register Service of Information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

September 10—Korea.—International Co-operation Administration for one 2-ton PICK-UP TRUCK, one 2-ton LORRY, two 2-ton LORRIES and four large UTILITY vehicles, all petrol-engined. Tenders to the Office of Supply, Government of the Republic of Korea, Seoul. (ESB/2018/58/ICA.)

September 15—Korea.—International Co-operation Administration for 300 metric tons of 40 lb./yd. RAIL and 300 metric tons of 30 lb./yd. RAIL, all in 30-ft. lengths, with SPICE BARS and TRACK BOLTS. Tenders to Dai Han Coal Corporation, Seoul. (ESB/2019/58/ICA.)

September 16—Formosa.—International Co-operation Administration for 50 urban PASSENGER COACHES for the Taiwan Railway Administration. Photocopies of tender documents from Export Services Branch, B.O.T., price 26s. (ESB/2064/58/ICA.)

September 18—Union of South Africa.—Department of Water Affairs for 25 end-tipping DUMP TRUCKS with 6 cu. yd. struck capacity scow-ended quarry bodies for a nett quarry payload of not less than 15,000 lb. Tenders to the Chairman, Union Tender and Supplies Board, 291 Bosman Street, P.O. Box 371, Pretoria. (ESB/2094/58.)

FINANCIAL RESULTS

NOTES on the trading results, dividends and financial provisions of companies associated with the transport industry are contained in this feature, together with details of share issues, acquisitions and company formations or reorganisations.

Triplex Holdings

Triplex Holdings, Limited, reports record results for the group trading profit for the year ended June 30. Group trading profit was £1,400,972 (£911,062). This reflects the buoyant conditions in the motor industry. In addition to maintaining the dividend at 20 per cent, the directors have declared a special interim dividend of 7½ per cent.

British Vacuum Cleaner and Engineering

The directors of the British Vacuum Cleaner and Engineering Co., Limited, recommend an issue, by way of capitalisation of reserves, of 1,200,000 ordinary shares of 5s. each credited as fully paid up to the holders of the existing 1,200,000 ordinary shares of 5s. each in the proportion of one new ordinary share for each ordinary share held. The directors do not anticipate a higher sum for distribution this year than last.

B.T.C. TRAFFIC RECEIPTS: PERIOD NO. 8—1958

	Four weeks to August 10, 1958				Aggregate for 33 weeks			
	1958 (£ thousands)	1957	+	or -	1958 (£ thousands)	1957	+	or -
PASSENGERS								
British Railways	16,331	16,869	—	538	86,667	89,365	—	2,702
London Transport	1,763	1,711	+	52	15,114	14,283	+	831
Railways	4,216	4,513	—	297	27,353	36,814	—	9,461
Road services	5,813	3,758	+	2,055	36,703	35,399	+	1,304
Provincial and Scottish Buses	1,345	1,352	—	7	4,262	4,256	+	6
Ships								
Total passengers	29,468	28,203	+	1,265	170,099	180,117	—	10,018
FREIGHT, PARCELS AND MAILS								
British Railways	5,855	6,675	—	820	57,462	66,616	—	9,154
Merchandise and livestock	2,539	3,356	—	817	28,341	32,290	—	3,949
Minerals	6,368	7,147	—	779	77,104	76,581	+	523
Coal and coke	3,885	3,782	+	103	31,532	30,666	+	866
Parcels, etc., by passenger train	893	922	—	29	7,625	8,247	—	622
Collection and delivery, etc.								
Total Freight British Railways	19,540	21,882	—	2,342	202,064	214,400	—	12,336
Others	3,862	3,943	—	81	33,307	33,560	—	253
Total Freight, Parcels and Mails	23,402	25,825	—	2,423	235,371	247,960	—	12,589
Aggregate	52,870	54,028	—	1,158	405,470	428,077	—	22,607

Comparisons are affected by increases in rates which have been authorised from time to time, by the provincial and Scottish bus strikes from July 20 to 28, 1957, by the London Transport road services strike from May 5 to June 20, 1958, and by the restrictions in oil supplies which operated from November 7, 1956, to May 14, 1957.

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Alternatives to Skye Steamer

THERE is to be a meeting on September 26 of the Highlands and Islands Advisory Panel at which proposals by David MacBrayne, Limited, for the reorganisation of its Western Isles services will be considered. They include the withdrawal of the *Lochnaveis* from the Mallaig-Kyle of Lochalsh-Portree (Skye) run; this ship would replace the *Lochnavar* on the Sound of Mull service.

This was stated by Lord Cameron, chairman of the Highlands and Islands Advisory Panel, after a meeting last week in Inverness of its sea transport group, the Scottish Tourist Board, Skye members of Inverness County Council, and representatives of David MacBrayne. He added that the *Lochnaveis* was at present running at a substantial and increasing annual loss. Also, the whole future of Portree pier, which is already due for substantial major repairs, depends on the answer which will have to be given to the future of the Skye steamer services. MacBrayne had offered to provide services of equal quality and quantity by buses connecting with the steamer services between Mallaig and Armadale and the existing ferry at Kyle. The proposals require the sanction of the Secretary of State for Scotland and the Minister of Transport before they can be put into operation.

New Field for K.P.M. Line

THE Netherlands shipping company K.P.M. (Koninklijke Paketvaart-Maatschappij) has now acquired the whole share capital of the Oranje Lijn company in Rotterdam. The Oranje Lijn has a fleet of 11 ships, and two freighters with passenger accommodation are on order. It maintains services between West European ports and Canadian and United States ports in the Great Lakes.

Cunarders to Make 39 Clyde Calls

IN 1959 Cunard liners will be making a record number of 39 calls at Greenock, on the Clyde. West-bound from Liverpool for Quebec and Montreal the Canadian service sisters, *Carinthia* and *Sylvania*, will call at Greenock on 17 occasions. East-bound calls at Greenock by the two 22,000-ton Cunarders will total 19. Three calls will be made by other liners.

Accommodation on Short-Sea Vessel

LAATEST addition to the fleet of George Gibson and Co., Limited, Leith, the motor ship *Yarrow* has made her maiden voyage to Antwerp. Built by the Grangemouth Dockyard Co., Limited, she has a cargo capacity of about 1,350 tons. During her trials in the Firth of Forth, the *Yarrow* had a service speed of 12½ knots. Accommodation is all grouped towards the after part of the ship and is of a very high standard, each officer and crew member having his own single room, while in addition space is provided for twelve passengers. There are four double-berth cabins and four single ones, each fitted with a bed rather than a bunk, the single-berth cabins have a settee as well as the usual wardrobe, drawers, etc. The owners, after having for many years been content with a plain black funnel, have now adorned it with two crossed flags, which are in fact the house flags of the two companies, George Gibson and Co., Limited, and James Rankine and Son, Limited, which together form the Gibson-Rankine Line.

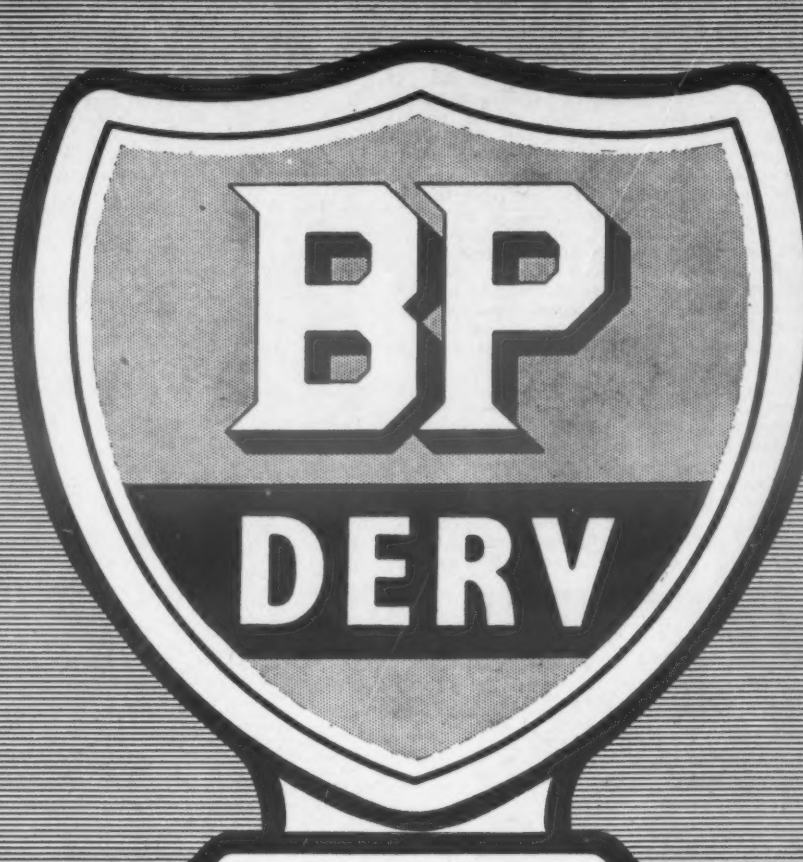
B.E.A. HAS GOOD YEAR

(Continued from page 13)

European air transport for high-speed jet aircraft and for more economical turboprop aircraft. B.E.A. plans for the mid-1960's envisage using the DH121 on longer international routes, where higher speeds show up to greatest advantage, and using the Vanguard on shorter international routes and the domestic trunk routes, where operating flexibility is of primary importance.

Low Margin of Profit Likely

The Vanguards, Comets and DH121's which B.E.A. now had on order represented a capital investment of over £50 millions. The financial charges associated with so large a commitment would represent an increasingly large proportion of the operating costs over the next ten years. It was the determination of the board of management of the corporation to ensure that operating costs were sufficiently reduced in other directions so that the total level of costs per ton mile continued to fall, and thus made possible the continued reduction in the level of fares and rates on which the expansion of the air travel market must largely depend. "We have made detailed, year-by-year studies of future financial prospects and we believe that future plans are economically and financially well-founded. The margins of profitability in some of the future years do, however, appear to be low. We believe that the whole air transport industry will continue to face this problem of inadequate profit margins until it recognises that its rate of re-equipment should be slowed down. We are urging the international airlines in I.A.T.A. to give serious thought to this problem. If, with the new generation of aircraft which the airlines of the world have on order, it were possible to extend commercial lives and thus depreciation of periods substantially beyond the seven years which is now general practice, the future financial prospects of the whole airline industry would be improved."

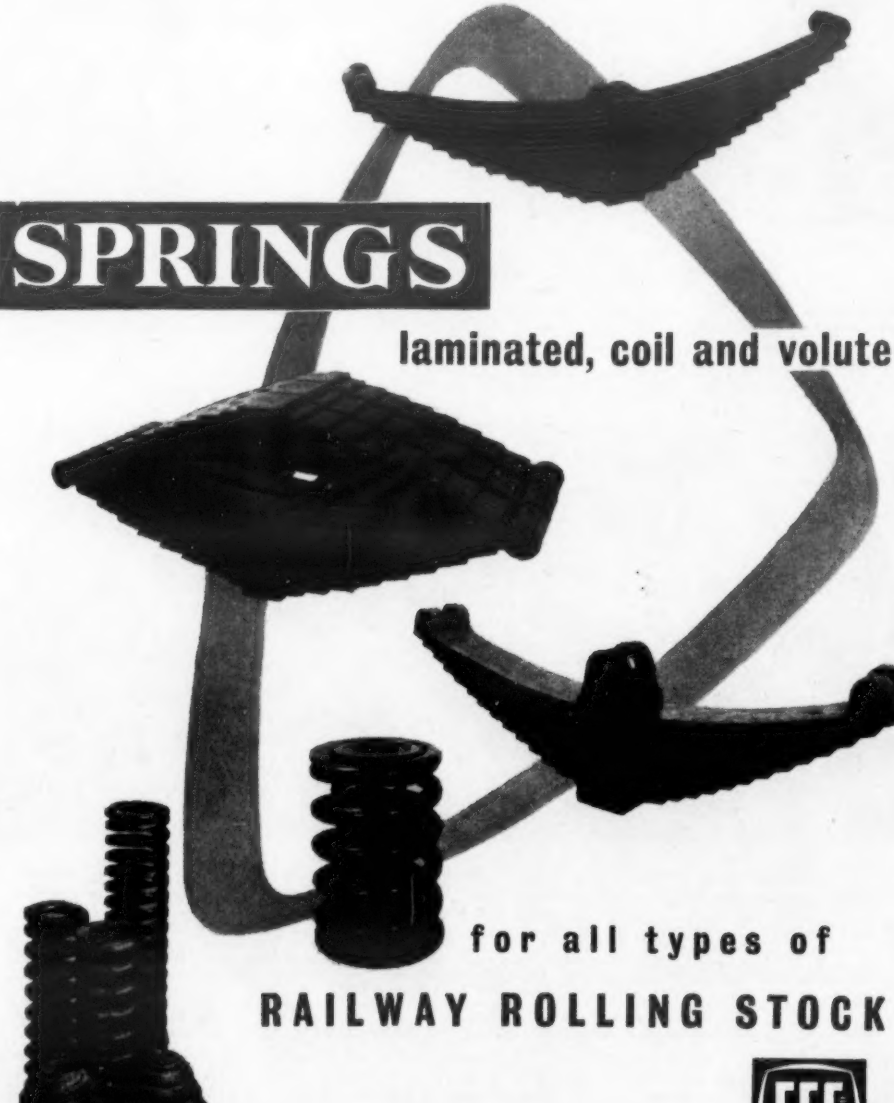


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